This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

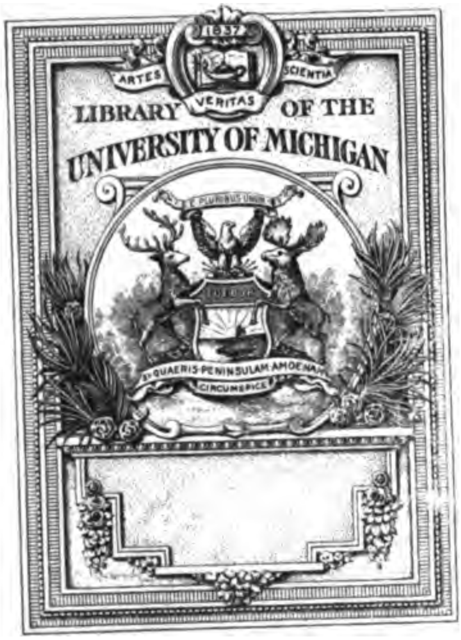
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

QB
8
.U5
2d ed.

THE

AMERICAN EPHEMERIS

361-1

AND

NAUTICAL ALMANAC

FOR THE YEAR

1891.

SECOND EDITION.

PUBLISHED IN COMPLIANCE WITH A JOINT RESOLUTION OF THE FORTY-SIXTH CONGRESS.

WASHINGTON:
BUREAU OF NAVIGATION.
1890.

JOINT RESOLUTION

FOR PRINTING THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be printed annually at the Government Printing Office fifteen hundred copies of the American Ephemeris and Nautical Almanac and of the papers supplementary thereto, of which one hundred shall be for the use of the Senate, four hundred for the House of Representatives, and one thousand for the public service, to be distributed by the Navy Department.

Sec. 2 *That additional copies of the Ephemeris and of the Nautical Almanac extracted therefrom may be ordered by the Secretary of the Navy for sale: Provided, That all moneys received from such sale shall be deposited in the Treasury to the credit of the appropriation for public printing.*

Approved, February 11, 1880.

PREFACE.

The arrangement of *The American Ephemeris* adopted in the volume for the year 1882, and explained in the Appendix to that volume, has been continued without radical change to the present time.

The additions then made comprise more complete data for eclipses of the sun, diagrams showing the configurations of the satellites of Jupiter, data respecting the disks of Mercury and Venus for the reduction of meridian and photometric observations, and diagrams, with tables, for identifying any known satellites of other planets. The work is divided into three parts, as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, gives the heliocentric and geocentric positions of the major planets, the Ephemeris of the Sun, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, gives the ephemerides of the fixed stars, sun, moon, and major planets for transit over the meridian of Washington. The mean places of the fixed stars and the data for their reduction are also included in this Part. The list of mean and apparent places of fixed stars has been greatly enlarged, for the convenience of field-astronomers.

Part III, *Phenomena*, contains predictions of phenomena to be observed, with data for their computation. Washington mean time is used in this part except in a few cases, notably that of eclipses, where Greenwich mean time was judged more convenient.

SIMON NEWCOMB,
Professor U. S. Navy, Superintendent.

Washington, *June*, 1888.

CONTENTS.

Page
Corrections . . . vi
Chronological Eras and Cycles . . . vii
Symbols and Abbreviations . . . viii

PART I—*EPHEMERIS FOR THE MERIDIAN OF GREENWICH.*

Pages of Each Month
Ephemeris of the Sun . . . I—III
Ephemeris of the Moon . . . IV—XII
Phases of the Moon . . . XII
Lunar Distances . . . XIII—XVIII
Page
Geocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 218
Heliocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 250
Sun's Co-ordinates . . . 264
Moon's Longitude and Latitude . . . 272
Moon's Equator and Libration . . . 276
Obliquity of the Ecliptic, Equation of Equinoxes, Precession, etc. . . . 278

PART II—*EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.*

BESSEL's Formulæ for Star-Reductions . . . 280
Besselian Star-Numbers, *A*, *B*, *C*, *D* . . . 281
Independent Star-Numbers, *f*, *g*, *h*, etc. . . . 285
Mean Places of Standard Stars for 1891.0 . . . 293
Apparent Places of Four Circumpolar Stars . . . 302
Apparent Places of Other Standard Stars . . . 314
Apparent Right Ascensions of Additional Stars . . . 365
Ephemeris of the Sun . . . 377
Moon-Culminations . . . 385
Transit-Ephemerides of the Planets Mercury, Venus, Jupiter, Saturn, Uranus, Neptune . . 393

PART III—*PHENOMENA.*

Eclipses . . . 410
Moon's Phases, Apogee, Perigee, and Greatest Libration . . . 415
Elements for the Prediction of Occultations . . . 416
Occultations Visible at Washington . . . 442
DOWNES's Table for Facilitating the Prediction of Occultations . . . 444
Disk of Mercury . . . 446
Disk of Venus . . . 447
Disk of Mars . . . 448
Satellites of Jupiter . . . 449
Satellites of Saturn . . . 474
Rings of Saturn . . . 477
Satellites of Uranus . . . 478
Satellite of Neptune . . . 479
Phenomena, Planetary Constellations . . . 480
Positions of Observatories . . . 482
On the Arrangement and Use of *The American Ephemeris and Nautical Almanac* . . 487

APPENDIX.

On the Construction of *The American Ephemeris and Nautical Almanac* for 1891 . . 513

TABLES.

Table I.—Correction of Lunar Distances for Second Differences in Moon's Motion.
Table II.—Reduction of Sidereal to Mean Solar Time.
Table III.—Reduction of Mean Solar to Sidereal Time.
Table IV.—Latitude by Observation of the Altitude of Polaris.

CORRECTIONS.

The American Nautical Almanac for 1888 (*First Edition*).

Page 248,	Ann. Var. in Dec. of δ Orionis,	*for* $-2'.93$	*read* $+2'.93$

Ephemeris for 1888 (*First Edition only*).

Page 293,	R. A. of 6 Ursæ Minoris,	*for* $20^{s}.008$	*read* $20^{s}.080$
294,	47 Cephei (H.) Ann. Var. in R. A.,	“ $+7^{s}.5152$	“ $+7^{s}.7152$
297,	β Chamæleontis, “ “	“ $+3^{s}.3706$	“ $+3^{s}.3996$
297,	α Canum Venat., “ “		“ $+2^{s}.8157$
298,	4 Ursæ Minoris, “ “	“ $-0^{s}.3349$	“ $-0^{s}.3249$
298,	ρ Bootis, Ann. Var. in Dec.,	“ $-15''.695$	“ $-15''.965$
299,	δ Ursæ Minoris, Dec.,	“ $20''.24$	“ $40''.24$
300,	θ Lyræ, R. A.,	“ $30^{s}.791$	“ $28^{s}.791$
302 to 312,	To the R. A. of α Ursæ Minoris apply the correction $-0^{s}.04$		
322,	Dec. of 11 Orionis,	*for* South	*read* North.

Ephemeris for 1890.

Page 487,	Dec. $31^{d}\ 2^{h}$,	*for* in Perihelion	*read* ⊕ in Perihelion.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1891, WHICH COMPRISES THE LATTER PART OF THE 115TH AND THE BEGINNING OF THE 116TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6604 of the Julian Period;
" 7399–7400 of the Byzantine era, the year 7400 commencing on September 1st;
" 5651–52 of the Jewish era, the year 5652 commencing on October 3d, or, more exactly, at sunset on October 2d;
" 2644 since the foundation of Rome, according to Varro;
" 2638 since the beginning of the era of Nabonassar, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period: corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of Christ;
" 2667 of the Olympiads, or the third year of the 667th Olympiad commencing in July, 1891, if we fix the era of the Olympiads at 775½ years before Christ, or near the beginning of July of the year 3938 of the Julian Period;
" 2203 of the Grecian era, or the era of the Seleucidæ;
" 1607 of the era of Diocletian;
" 2551 of the Japanese era and to the 24th year of the period entitled "Meiji."

The year 1309 of the Mohammedan era, or the era of the Hegira, begins on the 7th day of August, 1891.

The first day of January of the year 1891 is the 2,411,734th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	**D**	**Solar Cycle**	**24**
Epact	**20**	**Roman Indiction**	**4**
Lunar Cycle or Golden Number	**11**	**Julian Period**	**6604**

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	**Mars.**
☾	The Moon.	♃	**Jupiter.**
☿	Mercury.	♄	**Saturn.**
♀	Venus.	♅	**Uranus.**
⊕	The Earth.	♆	**Neptune.**

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	**Libra.**
	2.	♉	Taurus.		8.	♏	**Scorpius.**
	3.	♊	Gemini.		9.	♐	**Sagittarius.**
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	**Capricornus**
	5.	♌	Leo.		11.	♒	**Aquarius.**
	6.	♍	Virgo.		12.	♓	**Pisces.**

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing 90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.				
		h m s	s	° ′ ″	″	′ ″		s	m s	s
Thur.	1	18 47 9.38	11.041	S. 23 0 40.2	+12.44	16 18.41		71.09	3 44.85	1.181
Frid.	2	18 51 34.20	11.027	22 55 27.9	13.58	16 18.41		71.04	4 13.03	1.167
Sat.	3	18 55 58.71	11.013	22 49 48.2	14.72	16 18.40		70.99	4 40.90	1.153
SUN.	4	19 0 22.85	10.997	22 43 41.3	+15.85	16 18.38		70.94	5 8.41	1.137
Mon.	5	19 4 46.59	10.980	22 37 7.3	16.97	16 18.36		70.88	5 35.51	1.120
Tues.	6	19 9 9.89	10.962	22 30 6.5	18.09	16 18.33		70.82	6 2 18	1.102
Wed.	7	19 13 32.74	10.943	22 22 39.0	+19.20	16 18.30		70.75	6 28.40	1.083
Thur.	8	19 17 55.10	10.922	22 14 45.0	20.30	16 18.27		70.68	6 54.14	1.062
Frid.	9	19 22 16.94	10.900	22 6 24.8	21.38	16 18.23		70.61	7 19.35	1.040
Sat.	10	19 26 38.24	10.876	21 57 38.6	+22.46	16 18.19		70.53	7 44.03	1.016
SUN.	11	19 30 58.97	10.851	21 48 26.6	23.52	16 18.15		70.45	8 8.13	0.991
Mon.	12	19 35 19.09	10.825	21 38 49.1	24.58	16 18.10		70.37	8 31.63	0.965
Tues.	13	19 39 38.58	10.798	21 28 46.5	+25.62	16 18.05		70.28	8 54.50	0.939
Wed.	14	19 43 57.41	10.771	21 18 19.0	26.65	16 17.99		70.19	9 16.71	0.911
Thur.	15	19 48 15.57	10.742	21 7 26.9	27.66	16 17.93		70.10	9 38.26	0.882
Frid.	16	19 52 33.03	10.711	20 56 10.6	+28.67	16 17.86		70.01	9 59.10	0.852
Sat.	17	19 56 49.76	10.680	20 44 30.3	29.66	16 17.79		69.91	10 19.23	0.821
SUN.	18	20 1 5.76	10.649	20 32 26.5	30.64	16 17.71		69.81	10 38.62	0.790
Mon.	19	20 5 21.02	10.618	20 19 59.4	+31.60	16 17.63		69.71	10 57.27	0.759
Tues.	20	20 9 35.52	10.586	20 7 9.4	32.55	16 17.55		69.61	11 15.16	0.727
Wed.	21	20 13 49.24	10.554	19 53 56.8	33.48	16 17.46		69.51	11 32.28	0.695
Thur.	22	20 18 2.18	10.522	19 40 22.1	+34.40	16 17.36		69.40	11 48.62	0.663
Frid.	23	20 22 14.33	10.490	19 26 25.6	35.30	16 17.26		69.29	12 4.16	0.631
Sat.	24	20 26 25.68	10.457	19 12 7.6	36.19	16 17.15		69.18	12 18.91	0.598
SUN.	25	20 30 36.23	10.423	18 57 28.4	+37.06	16 17.04		69.07	12 32.87	0.565
Mon.	26	20 34 45.98	10.390	18 42 28.5	37.91	16 16.92		68.96	12 46.03	0.532
Tues.	27	20 38 54.94	10.357	18 27 8.2	38.75	16 16.79		68.85	12 58.39	0.499
Wed.	28	20 43 3.09	10.323	18 11 28.0	+39.58	16 16.66		68.73	13 9.95	0.465
Thur.	29	20 47 10.43	10.290	17 55 28.2	40.39	16 16.52		68.62	13 20.71	0.432
Frid.	30	20 51 16.97	10.256	17 39 9.1	41.19	16 16.38		68.50	13 30.67	0.398
Sat.	31	20 55 22.70	10.223	17 22 31.2	41.97	16 16.23		68.39	13 39.82	0.365
SUN.	32	20 59 27.63	10.189	S. 17 5 34.8	+42.73	16 16.08		68.27	13 48.17	0.331

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.19 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	18 47 8.69	11.037	S. 23 0 40.9	+12.43	3 44.77	1.181	18 43 23.92
Frid.	2	18 51 33.43	11.024	22 55 28.8	13.57	4 12.95	1.167	18 47 20.48
Sat.	3	18 55 57.85	11.010	22 49 49.4	14.71	4 40.81	1.153	18 51 17.04
SUN.	4	19 0 21.91	10.994	22 43 42.7	+15.84	5 8.31	1.137	18 55 13.60
Mon.	5	19 4 45.57	10.977	22 37 9.0	16.96	5 35.41	1.120	18 59 10.16
Tues.	6	19 9 8.79	10.959	22 30 8.4	18.08	6 2.07	1.102	19 3 6.72
Wed.	7	19 13 31.56	10.940	22 22 41.1	+19.19	6 28.29	1.083	19 7 3.27
Thur.	8	19 17 53.85	10.919	22 14 47.4	20.29	6 54.02	1.062	19 10 59.83
Frid.	9	19 22 15.62	10.897	22 6 27.4	21.37	7 19.23	1.040	19 14 56.39
Sat.	10	19 26 36.85	10.873	21 57 41.5	+22.45	7 43.90	1.016	19 18 52.95
SUN.	11	19 30 57.51	10.848	21 48 29.8	23.51	8 8.00	0.991	19 22 49.50
Mon.	12	19 35 17.56	10.822	21 38 52.6	24.57	8 31.50	0.965	19 26 46.06
Tues.	13	19 39 36.98	10.796	21 28 50.3	+25.61	8 54.36	0.939	19 30 42.62
Wed.	14	19 43 55.75	10.768	21 18 23.1	26.64	9 16.57	0.911	19 34 39.18
Thur.	15	19 48 13.85	10.739	21 7 31.4	27.65	9 38.12	0.882	19 38 35.73
Frid.	16	19 52 31.25	10.709	20 56 15.4	+28.66	9 58.96	0.852	19 42 32.29
Sat.	17	19 56 47.93	10.678	20 44 35.4	29.65	10 19.09	0.821	19 46 28.84
SUN.	18	20 1 3.88	10.647	20 32 31.9	30.63	10 38.48	0.790	19 50 25.40
Mon.	19	20 5 19 09	10.616	20 20 5.1	+31.59	10 57.13	0.759	19 54 21.96
Tues.	20	20 9 33.54	10.584	20 7 15.4	32.54	11 15.02	0.727	19 58 18.52
Wed.	21	20 13 47.22	10.552	19 54 3.2	33.47	11 32.14	0.695	20 2 15.08
Thur.	22	20 18 0.12	10.520	19 40 28.8	+34.39	11 48.48	0.663	20 6 11.64
Frid.	23	20 22 12.23	10.488	19 26 32.6	35.29	12 4.03	0.631	20 10 8.20
Sat.	24	20 26 23.54	10.455	19 12 14.9	36.18	12 18.79	0 598	20 14 4.75
SUN.	25	20 30 34.06	10.422	18 57 36.1	+37.05	12 32.75	0.565	20 18 1.31
Mon.	26	20 34 43.78	10.389	18 42 36.5	37.91	12 45.91	0.532	20 21 57.87
Tues.	27	20 38 52.71	10.356	18 27 16.6	38.74	12 58.28	0.499	20 25 54.43
Wed.	28	20 43 0.83	10.322	18 11 36.7	+39.57	13 9.85	0.465	20 29 50.98
Thur.	29	20 47 8.15	10.289	17 55 37.2	40.38	13 20.62	0.432	20 33 47.53
Frid.	30	20 51 14 67	10.255	17 39 18.4	41.18	13 30.58	0.398	20 37 44.09
Sat.	31	20 55 20.38	10.222	17 22 40.7	41.95	13 39.74	0.365	20 41 40.64
SUN.	32	20 59 25.29	10.186	S. 17 5 44.6	+42.72	13 48.10	0.331	20 45 37.19

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	280 50 32.3	50 48.1	152.90	+ 0.50	9.9926508	+ 0.8	5 15 44.21
2	2	281 51 41.9	51 57.5	152.91	0.47	9.9926538	1.8	5 11 48.30
3	3	282 52 51.8	53 7.2	152.92	0.40	9.9926591	2.7	5 7 52.39
4	4	283 54 1.9	54 17.1	152.93	+ 0.32	9.9926667	+ 3.6	5 3 56.48
5	5	284 55 12.2	55 27.3	152.93	0.21	9.9926764	4.4	5 0 0.57
6	6	285 56 22.7	56 37.6	152.94	+ 0.08	9.9926881	5.2	4 56 4.65
7	7	286 57 33.2	57 47.9	152.94	− 0.05	9.9927016	+ 6.0	4 52 8.74
8	8	287 58 43.7	58 58.1	152.93	0.18	9.9927168	6.7	4 48 12.83
9	9	288 59 54.0	60 8.3	152.92	0.30	9.9927337	7.4	4 44 16.92
10	10	290 1 4.1	1 18.3	152.92	− 0.40	9.9927523	+ 8.1	4 40 21.00
11	11	291 2 13.9	2 27.9	152.90	0.49	9.9927725	8.8	4 36 25.09
12	12	292 3 23.2	3 37.0	152.88	0.55	9.9927943	9.4	4 32 29.18
13	13	293 4 31.9	4 45.5	152.85	− 0.59	9.9928178	+10.1	4 28 33.27
14	14	294 5 40.0	5 53.4	152.82	0.60	9.9928431	10.9	4 24 37.36
15	15	295 6 47.4	7 0.6	152.79	0.57	9.9928702	11.7	4 20 41.45
16	16	296 7 54.0	8 7.1	152.76	− 0.52	9.9928992	+12.5	4 16 45.53
17	17	297 8 59.9	9 12.8	152.73	0.45	9.9929302	13.4	4 12 49.61
18	18	298 10 4.9	10 17.6	152.69	0.34	9.9929633	14.3	4 8 53.70
19	19	299 11 8.9	11 21.5	152.65	− 0.23	9.9929987	+15.3	4 4 57.79
20	20	300 12 12.0	12 24.4	152.61	− 0.10	9.9930365	16.3	4 1 1.88
21	21	301 13 14.1	13 26.4	152.57	+ 0.04	9.9930768	17.3	3 57 5.97
22	22	302 14 15.3	14 27.4	152.53	+ 0.17	9.9931196	+18.4	3 53 10.07
23	23	303 15 15.6	15 27.5	152.49	0.30	9.9931649	19.5	3 49 14.16
24	24	304 16 14.9	16 26.7	152.45	0.41	9.9932129	20.6	3 45 18.24
25	25	305 17 13.3	17 25.0	152.41	+ 0.49	9.9932637	+21.7	3 41 22.32
26	26	306 18 10.9	18 22.4	152.38	0.55	9.9933172	22.8	3 37 26.41
27	27	307 19 7.6	19 18.9	152.34	0.58	9.9933733	23.9	3 33 30.50
28	28	308 20 3.5	20 14.7	152.31	+ 0.58	9.9934318	+24.9	3 29 34.59
29	29	309 20 58.7	21 9.8	152.28	0.56	9.9934928	25.9	3 25 38.68
30	30	310 21 53.1	22 4.1	152.25	0.51	9.9935562	26.9	3 21 42.77
31	31	311 22 46.7	22 57.5	152.22	0.43	9.9936219	27.8	3 17 46.86
32	32	312 23 39.5	23 50.2	152.19	+ 0.32	9.9936897	+28.6	3 13 50.95

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour, —9ˢ.8296. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.5	14 50.7	54 14.2	+0.57	54 22.2	+0.78	17 15.4	1.70	20.4
2	14 53.6	14 57.1	54 32.7	0.99	54 45.8	1.20	17 56.2	1.72	21.4
3	15 1.4	15 6.3	55 1.4	1.41	55 19.5	1.61	18 37.8	1.78	22.4
4	15 11.9	15 18.0	55 39.9	+1.79	56 2.5	+1.96	19 21.5	1.89	23.4
5	15 24.7	15 31.7	56 26.9	2.10	56 52.9	2.22	20 8.5	2.05	24.4
6	15 39.2	15 46.7	57 20.1	2.29	57 47.9	2.32	20 59.9	2.24	25.4
7	15 54.3	16 1.8	58 15.8	+2.31	58 43.3	+2.25	21 56.3	2.45	26.4
8	16 9.0	16 15.7	59 9.7	2.13	59 34.3	1.95	22 57.3	2.63	27.4
9	16 21.7	16 26.9	59 56.4	1.72	60 15.5	1.44	6		28.4
10	16 31.1	16 34.3	60 31.0	+1.13	60 42.5	+0.78	0 1.1	2.66	29.4
11	16 36.2	16 37.0	60 49.7	+0.42	60 52.5	+0.05	1 4.9	2.61	0.9
12	16 36.6	16 35.0	60 51.0	−0.30	60 45.3	−0.64	2 6.2	2.47	1.9
13	16 32.4	16 28.9	60 35.7	−0.94	60 22.7	−1.21	3 3.3	2.30	2.9
14	16 24.5	16 19.6	60 6.8	1.42	59 48.6	1.59	3 56.8	2.16	3.9
15	16 14.1	16 8.3	59 28.6	1.72	59 7.3	1.80	4 47.1	2.05	4.9
16	16 2.4	15 56.3	58 45.4	−1.84	58 23.2	−1.85	5 35.4	2.00	5.9
17	15 50.3	15 44.4	58 1.0	1.83	57 39.3	1.78	6 23.0	1.99	6.9
18	15 38.6	15 33.1	57 18.2	1.72	56 58.0	1.64	7 11.1	2.02	7.9
19	15 27.9	15 23.0	56 38.8	−1.56	56 20.7	−1.47	8 0.1	2.07	8.9
20	15 18.3	15 14.0	56 3.6	1.38	55 47.7	1.28	8 50.7	2.13	9.9
21	15 9.9	15 6.2	55 32.8	1.20	55 19.0	1.11	9 42.5	2.17	10.9
22	15 2.7	14 59.5	55 6.3	−1.01	54 54.6	−0.93	10 34.8	2.16	11.9
23	14 56.6	14 54.0	54 44.0	0.85	54 34.4	0.76	11 26.4	2.11	12.9
24	14 51.7	14 49.7	54 25.8	0.67	54 18.3	0.58	12 16.3	2.03	13.9
25	14 47.9	14 46.4	54 11.8	−0.49	54 6.5	−0.39	13 3.8	1.93	14.9
26	14 45.3	14 44.6	54 2.5	0.28	53 59.8	−0.16	13 48.8	1.83	15.9
27	14 44.3	14 44.4	53 58.6	−0.04	53 58.9	+0.10	14 31.6	1.75	16.9
28	14 44.9	14 46.0	54 1.0	+0.25	54 4.9	+0.41	15 12.8	1.70	17.9
29	14 47.6	14 49.7	54 10.7	0.56	54 18.4	0.73	15 53.1	1.68	18.9
30	14 52.4	14 55.7	54 28.3	0.93	54 40.6	1.12	16 33.7	1.72	19.9
31	14 59.7	15 4.2	54 55.1	1.31	55 11.9	1.50	17 15.5	1.79	20.9
32	15 9.4	15 15.3	55 31.0	+1.69	55 52.4	+1.87	17 59.7	1.92	21.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 30 17.34	1.8277	N. 8 52 21.6	11.965	0	12 57 32.42	1.8344	S. 1 12 54.0	13.013
1	11 32 6.96	1.8263	8 40 22.6	12.002	1	12 59 22.54	1.8363	1 25 55.0	13.019
2	11 33 56.50	1.8250	8 28 21.4	12.038	2	13 1 12.78	1.8382	1 38 56.3	13.024
3	11 35 45.96	1.8237	8 16 18.0	12.073	3	13 3 3.13	1.8403	1 51 57.9	13.029
4	11 37 35.34	1.8224	8 4 12.6	12.108	4	13 4 53.61	1.8425	2 4 59.8	13.033
5	11 39 24.65	1.8212	7 52 5.1	12.142	5	13 6 44.23	1.8447	2 18 1.9	13.037
6	11 41 13.89	1.8201	7 39 55.6	12.175	6	13 8 34.98	1.8470	2 31 4.2	13.039
7	11 43 3.06	1.8190	7 27 44.1	12.207	7	13 10 25.87	1.8493	2 44 6.6	13.041
8	11 44 52.17	1.8181	7 15 30.7	12.239	8	13 12 16.90	1.8517	2 57 9.1	13.042
9	11 46 41.23	1.8172	7 3 15.4	12.271	9	13 14 8.08	1.8542	3 10 11.7	13.043
10	11 48 30.23	1.8163	6 50 58.2	12.302	10	13 15 59.41	1.8569	3 23 14.3	13.042
11	11 50 19.18	1.8154	6 38 39.2	12.332	11	13 17 50.90	1.8596	3 36 16.8	13.041
12	11 52 8.08	1.8147	6 26 18.4	12.361	12	13 19 42.56	1.8623	3 49 19.2	13.039
13	11 53 56.94	1.8140	6 13 55.8	12.390	13	13 21 34.38	1.8651	4 2 21.5	13.037
14	11 55 45.76	1.8134	6 1 31.5	12.419	14	13 23 26.37	1.8680	4 15 23.6	13.033
15	11 57 34.55	1.8128	5 49 5.5	12.447	15	13 25 18.54	1.8710	4 28 25.5	13.029
16	11 59 23.30	1.8123	5 36 37.9	12.474	16	13 27 10.89	1.8741	4 41 27.1	13.024
17	12 1 12.03	1.8120	5 24 8.7	12.501	17	13 29 3.43	1.8772	4 54 28.4	13.018
18	12 3 0.74	1.8117	5 11 37.8	12.527	18	13 30 56.15	1.8804	5 7 29.3	13.012
19	12 4 49.43	1.8114	4 59 5.4	12.552	19	13 32 49.07	1.8837	5 20 29.8	13.005
20	12 6 38.11	1.8112	4 46 31.5	12.577	20	13 34 42.19	1.8871	5 33 29.9	12.997
21	12 8 26.77	1.8110	4 33 56.2	12.601	21	13 36 35.52	1.8905	5 46 29.4	12.987
22	12 10 15.43	1.8110	4 21 19.4	12.624	22	13 38 29.05	1.8940	5 59 28.3	12.977
23	12 12 4.09	1.8110	N. 4 8 41.3	12.647	23	13 40 22.80	1.8977	S. 6 12 26.7	12.967
	FRIDAY 2.					SUNDAY 4.			
0	12 13 52.75	1.8110	N. 3 56 1.8	12.669	0	13 42 16.77	1.9014	S. 6 25 24.4	12.956
1	12 15 41.41	1.8112	3 43 21.0	12.691	1	13 44 10.96	1.9051	6 38 21.4	12.943
2	12 17 30.09	1.8114	3 30 38.9	12.712	2	13 46 5.38	1.9090	6 51 17.6	12.930
3	12 19 18.78	1.8117	3 17 55.6	12.732	3	13 48 0.04	1.9129	7 4 13.0	12.916
4	12 21 7.49	1.8121	3 5 11.1	12.752	4	13 49 54.93	1.9168	7 17 7.5	12.900
5	12 22 56.23	1.8125	2 52 25.4	12.772	5	13 51 50.06	1.9209	7 30 1.0	12.883
6	12 24 44.99	1.8130	2 39 38.5	12.790	6	13 53 45.44	1.9251	7 42 53.5	12.867
7	12 26 33.79	1.8136	2 26 50.6	12.808	7	13 55 41.07	1.9293	7 55 45.0	12.850
8	12 28 22.62	1.8142	2 14 1.6	12.826	8	13 57 36.96	1.9336	8 8 35.5	12.832
9	12 30 11.49	1.8149	2 1 11.6	12.842	9	13 59 33.11	1.9380	8 21 24.8	12.812
10	12 32 0.40	1.8157	1 48 20.6	12.857	10	14 1 29.52	1.9425	8 34 12.9	12.791
11	12 33 49.37	1.8166	1 35 28.7	12.872	11	14 3 26.21	1.9471	8 46 59.7	12.769
12	12 35 38.39	1.8174	1 22 35.9	12.887	12	14 5 23.17	1.9517	8 59 45.2	12.747
13	12 37 27.46	1.8184	1 9 42.3	12.902	13	14 7 20.41	1.9564	9 12 29.3	12.723
14	12 39 16.60	1.8196	0 56 47.8	12.915	14	14 9 17.94	1.9612	9 25 12.0	12.698
15	12 41 5.81	1.8208	0 43 52.5	12.928	15	14 11 15.76	1.9661	9 37 53.1	12.673
16	12 42 55.09	1.8220	0 30 56.4	12.940	16	14 13 13.87	1.9710	9 50 32.7	12.647
17	12 44 44.45	1.8232	0 17 59.7	12.951	17	14 15 12.28	1.9760	10 3 10.7	12.619
18	12 46 33.88	1.8246	N. 0 5 2.3	12.962	18	14 17 10.99	1.9811	10 15 47.0	12.590
19	12 48 23.40	1.8261	S. 0 7 55.8	12.972	19	14 19 10.01	1.9863	10 28 21.5	12.560
20	12 50 13.01	1.8276	0 20 54.4	12.982	20	14 21 9.35	1.9916	10 40 54.2	12.530
21	12 52 2.71	1.8292	0 33 53.6	12.991	21	14 23 9.00	1.9969	10 53 25.1	12.498
22	12 53 52.51	1.8308	0 46 53.3	12.998	22	14 25 8.97	2.0023	11 5 54.0	12.465
23	12 55 42.41	1.8326	0 59 53.4	13.006	23	14 27 9.27	2.0078	11 18 20.9	12.431
24	12 57 32.42	1.8344	S. 1 12 54.0	13.013	24	14 29 9.91	2.0134	S. 11 30 45.7	12.395

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 29 9.91	2.0134	S. 11 30 45.7	12.395
1	14 31 10.88	2.0190	11 43 8.3	12.359
2	14 33 12.19	2.0247	11 55 28.8	12.322
3	14 35 13.84	2.0304	12 7 47.0	12.283
4	14 37 15.84	2.0363	12 20 2.8	12.243
5	14 39 18.20	2.0422	12 32 16.2	12.202
6	14 41 20.91	2.0482	12 44 27.1	12.160
7	14 43 23.98	2.0543	12 56 35.4	12.117
8	14 45 27.42	2.0604	13 8 41.1	12.073
9	14 47 31.23	2.0667	13 20 44.1	12.027
10	14 49 35.42	2.0730	13 32 44.3	11.979
11	14 51 39.99	2.0793	13 44 41.6	11.930
12	14 53 44.94	2.0857	13 56 35.9	11.880
13	14 55 50.27	2.0922	14 8 27.2	11.829
14	14 57 56.00	2.0987	14 20 15.4	11.777
15	15 0 2.12	2.1054	14 32 0.5	11.724
16	15 2 8.64	2.1121	14 43 42.3	11.668
17	15 4 15.57	2.1188	14 55 20.7	11.612
18	15 6 22.90	2.1256	15 6 55.7	11.554
19	15 8 30.64	2.1325	15 18 27.2	11.495
20	15 10 38.80	2.1394	15 29 55.1	11.436
21	15 12 47.37	2.1463	15 41 19.4	11.373
22	15 14 56.36	2.1534	15 52 39.9	11.310
23	15 17 5.78	2.1605	S. 16 3 56.6	11.245

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 19 15.62	2.1676	S. 16 15 9.3	11.178
1	15 21 25.89	2.1748	16 26 18.0	11.111
2	15 23 36.60	2.1821	16 37 22.6	11.042
3	15 25 47.75	2.1895	16 48 23.0	10.971
4	15 27 59.34	2.1968	16 59 19.1	10.899
5	15 30 11.37	2.2042	17 10 10.9	10.826
6	15 32 23.84	2.2116	17 20 58.2	10.750
7	15 34 36.76	2.2191	17 31 40.9	10.673
8	15 36 50.14	2.2267	17 42 19.0	10.596
9	15 39 3.97	2.2343	17 52 52.4	10.516
10	15 41 18.26	2.2419	18 3 20.9	10.434
11	15 43 33.00	2.2495	18 13 44.5	10.352
12	15 45 48.20	2.2572	18 24 3.1	10.267
13	15 48 3.87	2.2650	18 34 16.6	10.181
14	15 50 20.00	2.2728	18 44 24.8	10.093
15	15 52 36.60	2.2806	18 54 27.7	10.003
16	15 54 53.67	2.2883	19 4 25.2	9.912
17	15 57 11.20	2.2961	19 14 17.2	9.819
18	15 59 29.20	2.3040	19 24 3.5	9.724
19	16 1 47.68	2.3119	19 33 44.1	9.628
20	16 4 6.63	2.3198	19 43 18.9	9.531
21	16 6 26.05	2.3277	19 52 47.8	9.432
22	16 8 45.95	2.3357	20 2 10.7	9.331
23	16 11 6.33	2.3436	20 11 27.5	9.228
24	16 13 27.18	2.3515	S. 20 20 38.0	9.123

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 13 27.18	2.3515	S. 20 20 38.0	9.123
1	16 15 48.51	2.3595	20 29 42.2	9.017
2	16 18 10.32	2.3674	20 38 40.0	8.909
3	16 20 32.60	2.3753	20 47 31.3	8.799
4	16 22 55.36	2.3833	20 56 15.9	8.688
5	16 25 18.59	2.3912	21 4 53.8	8.575
6	16 27 42.30	2.3992	21 13 24.9	8.460
7	16 30 6.49	2.4071	21 21 49.0	8.343
8	16 32 31.15	2.4149	21 30 6.1	8.226
9	16 34 56.28	2.4227	21 38 16.1	8.106
10	16 37 21.88	2.4306	21 46 18.8	7.983
11	16 39 47.95	2.4384	21 54 14.1	7.860
12	16 42 14.49	2.4462	22 2 2.0	7.735
13	16 44 41.49	2.4539	22 9 42.3	7.606
14	16 47 8.96	2.4616	22 17 15.0	7.480
15	16 49 36.89	2.4693	22 24 39.9	7.350
16	16 52 5.28	2.4770	22 31 57.0	7.218
17	16 54 34.13	2.4846	22 39 6.1	7.084
18	16 57 3.43	2.4921	22 46 7.1	6.949
19	16 59 33.18	2.4996	22 53 0.0	6.812
20	17 2 3.38	2.5070	22 59 44.6	6.673
21	17 4 34.02	2.5144	23 6 20.8	6.533
22	17 7 5.10	2.5217	23 12 48.6	6.392
23	17 9 36.62	2.5289	S. 23 19 7.8	6.248

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 12 8.57	2.5361	S. 23 25 18.3	6.103
1	17 14 40.95	2.5432	23 31 20.1	5.956
2	17 17 13.75	2.5502	23 37 13.0	5.808
3	17 19 46.97	2.5571	23 42 57.0	5.658
4	17 22 20.60	2.5639	23 48 31.9	5.506
5	17 24 54.64	2.5706	23 53 57.7	5.352
6	17 27 29.07	2.5772	23 59 14.2	5.196
7	17 30 3.90	2.5838	24 4 21.4	5.040
8	17 32 39.12	2.5903	24 9 19.2	4.884
9	17 35 14.73	2.5967	24 14 7.5	4.725
10	17 37 50.72	2.6028	24 18 46.2	4.564
11	17 40 27.07	2.6089	24 23 15.2	4.402
12	17 43 3.79	2.6150	24 27 34.5	4.239
13	17 45 40.87	2.6208	24 31 43.9	4.074
14	17 48 18.29	2.6265	24 35 43.4	3.908
15	17 50 56.05	2.6322	24 39 32.9	3.741
16	17 53 34.15	2.6377	24 43 12.3	3.572
17	17 56 12.57	2.6430	24 46 41.5	3.402
18	17 58 51.31	2.6482	24 50 0.5	3.231
19	18 1 30.36	2.6533	24 53 9.2	3.058
20	18 4 9.71	2.6582	24 56 7.5	2.885
21	18 6 49.35	2.6631	24 58 55.4	2.711
22	18 9 29.28	2.6677	25 1 32.8	2.535
23	18 12 9.48	2.6722	25 3 59.6	2.357
24	18 14 49.94	2.6765	S. 25 6 15.7	2.179

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 14 49.94	2.6765	S.25 6 15.7	2.179
1	18 17 30.66	2.6807	25 8 21.1	2.001
2	18 20 11.63	2.6847	25 10 15.8	1.822
3	18 22 52.83	2.6886	25 11 59.8	1.642
4	18 25 34.26	2.6923	25 13 32.9	1.460
5	18 28 15.91	2.6959	25 14 55.0	1.278
6	18 30 57.77	2.6992	25 16 6.2	1.095
7	18 33 39.82	2.7024	25 17 6.4	0.911
8	18 36 22.06	2.7055	25 17 55.5	0.727
9	18 39 4.48	2.7083	25 18 33.6	0.542
10	18 41 47.06	2.7109	25 19 0.6	0.357
11	18 44 29.79	2.7134	25 19 16.4	− 0.170
12	18 47 12.67	2.7157	25 19 21.0	+ 0.017
13	18 49 55.68	2.7179	25 19 14.4	0.204
14	18 52 38.82	2.7199	25 18 56.5	0.392
15	18 55 22.07	2.7217	25 18 27.4	0.579
16	18 58 5.42	2.7232	25 17 47.0	0.767
17	19 0 48.86	2.7246	25 16 55.3	0.956
18	19 3 32.37	2.7258	25 15 52.3	1.144
19	19 6 15.95	2.7268	25 14 38.0	1.333
20	19 8 59.59	2.7277	25 13 12.3	1.522
21	19 11 43.28	2.7284	25 11 35.3	1.712
22	19 14 27.00	2.7288	25 9 46.9	1.901
23	19 17 10.74	2.7292	S.25 7 47.2	2.090

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 19 54.50	2.7293	S.25 5 36.1	2.279
1	19 22 38.26	2.7292	25 3 13.7	2.468
2	19 25 22.01	2.7289	25 0 40.0	2.657
3	19 28 5.73	2.7284	24 57 54.9	2.846
4	19 30 49.42	2.7278	24 54 58.5	3.033
5	19 33 33.07	2.7271	24 51 50.9	3.221
6	19 36 16.67	2.7261	24 48 32.0	3.409
7	19 39 0.20	2.7249	24 45 1.8	3.596
8	19 41 43.66	2.7236	24 41 20.5	3.782
9	19 44 27.03	2.7220	24 37 28.0	3.968
10	19 47 10.30	2.7203	24 33 24.3	4.154
11	19 49 53.47	2.7185	24 29 9.5	4.339
12	19 52 36.52	2.7164	24 24 43.6	4.523
13	19 55 19.44	2.7142	24 20 6.7	4.707
14	19 58 2.23	2.7119	24 15 18.8	4.890
15	20 0 44.87	2.7093	24 10 19.9	5.072
16	20 3 27.35	2.7066	24 5 10.1	5.253
17	20 6 9.66	2.7037	23 59 49.5	5.433
18	20 8 51.80	2.7008	23 54 18.2	5.612
19	20 11 33.76	2.6977	23 48 36.1	5.791
20	20 14 15.52	2.6943	23 42 43.3	5.968
21	20 16 57.08	2.6909	23 36 39.9	6.145
22	20 19 38.43	2.6873	23 30 25.9	6.321
23	20 22 19.56	2.6836	23 24 1.4	6.494
24	20 25 0.46	2.6797	S.23 17 26.6	6.667

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 25 0.46	2.6797	S.23 17 26.6	6.667
1	20 27 41.12	2.6757	23 10 41.4	6.839
2	20 30 21.54	2.6716	23 3 45.9	7.009
3	20 33 1.71	2.6673	22 56 40.3	7.178
4	20 35 41.62	2.6629	22 49 24.6	7.346
5	20 38 21.26	2.6583	22 41 58.8	7.512
6	20 41 0.62	2.6537	22 34 23.1	7.677
7	20 43 39.70	2.6490	22 26 37.5	7.841
8	20 46 18.50	2.6442	22 18 42.2	8.003
9	20 48 57.00	2.6392	22 10 37.2	8.163
10	20 51 35.20	2.6341	22 2 22.6	8.323
11	20 54 13.09	2.6289	21 53 58.4	8.482
12	20 56 50.67	2.6237	21 45 24.8	8.638
13	20 59 27.93	2.6183	21 36 41.9	8.792
14	21 2 4.87	2.6128	21 27 49.8	8.944
15	21 4 41.47	2.6073	21 18 48.6	9.095
16	21 7 17.74	2.6017	21 9 38.4	9.244
17	21 9 53.67	2.5960	21 0 19.3	9.392
18	21 12 29.26	2.5903	20 50 51.3	9.539
19	21 15 4.51	2.5845	20 41 14.6	9.683
20	21 17 39.40	2.5785	20 31 29.3	9.825
21	21 20 13.93	2.5726	20 21 35.6	9.965
22	21 22 48.10	2.5665	20 11 33.5	10.104
23	21 25 21.91	2.5605	S.20 1 23.1	10.242

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 27 55.36	2.5544	S.19 51 4.5	10.377
1	21 30 28.44	2.5482	19 40 37.9	10.510
2	21 33 1.14	2.5419	19 30 3.3	10.642
3	21 35 33.47	2.5356	19 19 20.9	10.771
4	21 38 5.42	2.5294	19 8 30.8	10.898
5	21 40 36.99	2.5231	18 57 33.1	11.025
6	21 43 8.19	2.5167	18 46 27.8	11.149
7	21 45 39.00	2.5102	18 35 15.2	11.271
8	21 48 9.42	2.5038	18 23 55.3	11.391
9	21 50 39.46	2.4974	18 12 28.3	11.508
10	21 53 9.11	2.4910	18 0 54.3	11.624
11	21 55 38.38	2.4846	17 49 13.4	11.739
12	21 58 7.26	2.4781	17 37 25.6	11.852
13	22 0 35.75	2.4716	17 25 31.1	11.962
14	22 3 3.85	2.4651	17 13 30.1	12.069
15	22 5 31.56	2.4586	17 1 22.8	12.174
16	22 7 58.88	2.4521	16 49 9.2	12.279
17	22 10 25.81	2.4457	16 36 49.3	12.383
18	22 12 52.36	2.4392	16 24 23.2	12.484
19	22 15 18.52	2.4327	16 11 51.2	12.582
20	22 17 44.29	2.4262	15 59 13.4	12.678
21	22 20 9.67	2.4198	15 46 29.9	12.773
22	22 22 34.67	2.4134	15 33 40.7	12.865
23	22 24 59.28	2.4070	15 20 46.1	12.956
24	22 27 23.51	2.4007	S.15 7 46.1	13.043

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 27 23.51	2.4007	S. 15 7 46.1	13.043	0	0 16 10.43	2.1562	S. 3 35 27.4	15.130
1	22 29 47.36	2.3943	14 54 40.9	13.130	1	0 18 19.70	2.1529	3 20 19.5	15.132
2	22 32 10.83	2.3880	14 41 30.5	13.215	2	0 20 28.78	2.1497	3 5 11.5	15.133
3	22 34 33.92	2.3817	14 28 15.1	13.297	3	0 22 37.67	2.1466	2 50 3.5	15.133
4	22 36 56.63	2.3754	14 14 54.8	13.378	4	0 24 46.37	2.1434	2 34 55.5	15.132
5	22 39 18.97	2.3692	14 1 29.7	13.457	5	0 26 54.88	2.1403	2 19 47.6	15.129
6	22 41 40.94	2.3631	13 48 0.0	13.533	6	0 29 3.20	2.1373	2 4 40.0	15.124
7	22 44 2.54	2.3569	13 34 25.7	13.608	7	0 31 11.35	2.1345	1 49 32.7	15.119
8	22 46 23.77	2.3508	13 20 47.0	13.681	8	0 33 19.34	2.1317	1 34 25.7	15.113
9	22 48 44.63	2.3447	13 7 4.0	13.752	9	0 35 27.16	2.1290	1 19 19.1	15.105
10	22 51 5.13	2.3387	12 53 16.8	13.821	10	0 37 34.82	2.1263	1 4 13.1	15.096
11	22 53 25.27	2.3327	12 39 25.5	13.888	11	0 39 42.32	2.1237	0 49 7.7	15.083
12	22 55 45.06	2.3268	12 25 30.2	13.953	12	0 41 49.67	2.1212	0 34 3.1	15.070
13	22 58 4.49	2.3209	12 11 31.1	14.017	13	0 43 56.87	2.1189	0 18 59.3	15.057
14	23 0 23.57	2.3151	11 57 28.2	14.078	14	0 46 3.94	2.1166	S. 0 3 56.3	15.043
15	23 2 42.31	2.3094	11 43 21.7	14.137	15	0 48 10.87	2.1143	N. 0 11 5.9	15.027
16	23 5 0.70	2.3037	11 29 11.7	14.195	16	0 50 17.66	2.1122	0 26 7.0	15.009
17	23 7 18.75	2.2980	11 14 58.3	14.252	17	0 52 24.33	2.1102	0 41 7.0	14.990
18	23 9 36.46	2.2923	11 0 41.5	14.306	18	0 54 30.88	2.1082	0 56 5.8	14.969
19	23 11 53.83	2.2867	10 46 21.5	14.358	19	0 56 37.31	2.1062	1 11 3.3	14.948
20	23 14 10.87	2.2813	10 31 58.5	14.407	20	0 58 43.63	2.1043	1 25 59.6	14.927
21	23 16 27.59	2.2760	10 17 32.6	14.456	21	1 0 49.83	2.1025	1 40 54.5	14.903
22	23 18 43.99	2.2706	10 3 3.8	14.503	22	1 2 55.93	2.1009	1 55 47.9	14.878
23	23 21 0.07	2.2653	S. 9 48 32.2	14.549	23	1 5 1.94	2.0993	N. 2 10 39.8	14.852
	WEDNESDAY 14.					**FRIDAY 16.**			
0	23 23 15.83	2.2601	S. 9 33 57.9	14.592	0	1 7 7.85	2.0977	N. 2 25 30.1	14.824
1	23 25 31.28	2.2549	9 19 21.1	14.633	1	1 9 13.67	2.0963	2 40 18.7	14.795
2	23 27 46.42	2.2498	9 4 41.9	14.672	2	1 11 19.41	2.0950	2 55 5.5	14.765
3	23 30 1.26	2.2448	8 50 0.4	14.711	3	1 13 25.07	2.0937	3 9 50.5	14.734
4	23 32 15.80	2.2398	8 35 16.6	14.747	4	1 15 30.66	2.0925	3 24 33.6	14.702
5	23 34 30.04	2.2349	8 20 30.7	14.782	5	1 17 36.17	2.0913	3 39 14.8	14.669
6	23 36 43.99	2.2301	8 5 42.8	14.814	6	1 19 41.61	2.0902	3 53 53.9	14.634
7	23 38 57.66	2.2254	7 50 53.0	14.846	7	1 21 46.99	2.0892	4 8 30.9	14.599
8	23 41 11.04	2.2207	7 36 1.3	14.875	8	1 23 52.32	2.0883	4 23 5.8	14.562
9	23 43 24.14	2.2161	7 21 8.0	14.902	9	1 25 57.59	2.0875	4 37 38.4	14.524
10	23 45 36.97	2.2116	7 6 13.1	14.928	10	1 28 2.82	2.0867	4 52 8.7	14.485
11	23 47 49.54	2.2072	6 51 16.6	14.953	11	1 30 8.00	2.0860	5 6 36.6	14.445
12	23 50 1.84	2.2028	6 36 18.7	14.976	12	1 32 13.14	2.0853	5 21 2.1	14.404
13	23 52 13.88	2.1985	6 21 19.5	14.997	13	1 34 18.24	2.0848	5 35 25.1	14.362
14	23 54 25.66	2.1943	6 6 19.0	15.017	14	1 36 23.32	2.0844	5 49 45.5	14.318
15	23 56 37.19	2.1902	5 51 17.4	15.035	15	1 38 28.37	2.0840	6 4 3.3	14.273
16	23 58 48.48	2.1861	5 36 14.8	15.052	16	1 40 33.40	2.0836	6 18 18.3	14.228
17	0 0 59.52	2.1820	5 21 11.2	15.067	17	1 42 38.41	2.0833	6 32 30.6	14.182
18	0 3 10.32	2.1781	5 6 6.8	15.080	18	1 44 43.40	2.0831	6 46 40.1	14.134
19	0 5 20.89	2.1743	4 51 1.6	15.092	19	1 46 48.38	2.0830	7 0 46.7	14.085
20	0 7 31.24	2.1706	4 35 55.7	15.102	20	1 48 53.36	2.0830	7 14 50.3	14.035
21	0 9 41.36	2.1669	4 20 49.3	15.111	21	1 50 58.34	2.0830	7 28 50.9	13.984
22	0 11 51.26	2.1633	4 5 42.4	15.118	22	1 53 3.32	2.0830	7 42 48.4	13.932
23	0 14 0.95	2.1597	3 50 35.1	15.125	23	1 55 8.30	2.0831	7 56 42.7	13.879
24	0 16 10.43	2.1562	S. 3 35 27.4	15.130	24	1 57 13.29	2.0833	N. 8 10 33.9	13.826

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 57 13.29	2.0833	N. 8 10 33.9	13.828
1	1 59 18.30	2.0836	8 24 21.8	13.771
2	2 1 23.33	2.0839	8 38 6.4	13.714
3	2 3 28.37	2.0842	8 51 47.5	13.657
4	2 5 33.44	2.0847	9 5 25.2	13.599
5	2 7 38.54	2.0853	9 18 59.4	13.541
6	2 9 43.68	2.0860	9 32 30.1	13.482
7	2 11 48.86	2.0866	9 45 57.2	13.420
8	2 13 54.07	2.0872	9 59 20.5	13.358
9	2 15 59.32	2.0879	10 12 40.1	13.295
10	2 18 4.62	2.0888	10 25 55.9	13.232
11	2 20 9.98	2.0897	10 39 7.9	13.167
12	2 22 15.39	2.0906	10 52 15.9	13.100
13	2 24 20.85	2.0916	11 5 19.9	13.033
14	2 26 26.38	2.0927	11 18 19.9	12.967
15	2 28 31.97	2.0938	11 31 15.9	12.899
16	2 30 37.63	2.0949	11 44 7.8	12.829
17	2 32 43.36	2.0961	11 56 55.4	12.758
18	2 34 49.16	2.0973	12 9 38.7	12.686
19	2 36 55.04	2.0987	12 22 17.7	12.614
20	2 39 1.00	2.1000	12 34 52.4	12.542
21	2 41 7.04	2.1014	12 47 22.7	12.468
22	2 43 13.17	2.1029	12 59 48.5	12.392
23	2 45 19.39	2.1043	N.13 12 9.7	12.316

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 47 25.69	2.1058	N.13 24 26.4	12.240
1	2 49 32.09	2.1075	13 36 38.5	12.162
2	2 51 38.59	2.1091	13 48 45.8	12.083
3	2 53 45.18	2.1108	14 0 48.4	12.003
4	2 55 51.88	2.1125	14 12 46.2	11.923
5	2 57 58.68	2.1142	14 24 39.1	11.842
6	3 0 5.58	2.1159	14 36 27.2	11.760
7	3 2 12.59	2.1177	14 48 10.3	11.677
8	3 4 19.71	2.1196	14 59 48.4	11.592
9	3 6 26.95	2.1216	15 11 21.4	11.507
10	3 8 34.30	2.1235	15 22 49.3	11.422
11	3 10 41.77	2.1254	15 34 12.0	11.336
12	3 12 49.35	2.1273	15 45 29.6	11.249
13	3 14 57.05	2.1294	15 56 41.9	11.161
14	3 17 4.88	2.1315	16 7 48.9	11.072
15	3 19 12.83	2.1336	16 18 50.5	10.982
16	3 21 20.91	2.1357	16 29 46.7	10.891
17	3 23 29.11	2.1378	16 40 37.4	10.799
18	3 25 37.44	2.1399	16 51 22.6	10.707
19	3 27 45.90	2.1421	17 2 2.3	10.614
20	3 29 54.49	2.1443	17 12 36.3	10.520
21	3 32 3.22	2.1466	17 23 4.7	10.426
22	3 34 12.08	2.1488	17 33 27.4	10.330
23	3 36 21.08	2.1511	17 43 44.3	10.234
24	3 38 30.21	2.1533	N.17 53 55.4	10.137

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 38 30.21	2.1533	N.17 53 55.4	10.137
1	3 40 39.48	2.1556	18 4 0.7	10.039
2	3 42 48.88	2.1579	18 14 0.1	9.940
3	3 44 58.43	2.1603	18 23 53.5	9.840
4	3 47 8.12	2.1626	18 33 40.9	9.740
5	3 49 17.94	2.1649	18 43 22.3	9.640
6	3 51 27.90	2.1672	18 52 57.7	9.538
7	3 53 38.00	2.1695	19 2 26.9	9.435
8	3 55 48.24	2.1719	19 11 49.9	9.332
9	3 57 58.63	2.1743	19 21 6.7	9.228
10	4 0 9.16	2.1767	19 30 17.3	9.123
11	4 2 19.83	2.1790	19 39 21.5	9.018
12	4 4 30.64	2.1813	19 48 19.4	8.912
13	4 6 41.59	2.1837	19 57 10.9	8.805
14	4 8 52.68	2.1861	20 5 56.0	8.697
15	4 11 3.92	2.1885	20 14 34.6	8.589
16	4 13 15.30	2.1908	20 23 6.7	8.480
17	4 15 26.81	2.1931	20 31 32.2	8.370
18	4 17 38.47	2.1955	20 39 51.1	8.260
19	4 19 50.27	2.1978	20 48 3.4	8.149
20	4 22 2.20	2.2000	20 56 9.0	8.038
21	4 24 14.27	2.2023	21 4 7.9	7.926
22	4 26 26.48	2.2046	21 12 0.1	7.812
23	4 28 38.82	2.2068	N.21 19 45.4	7.698

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 30 51.29	2.2089	N.21 27 23.9	7.584
1	4 33 3.89	2.2112	21 34 55.5	7.469
2	4 35 16.63	2.2134	21 42 20.2	7.354
3	4 37 29.50	2.2156	21 49 38.0	7.238
4	4 39 42.50	2.2177	21 56 48.8	7.122
5	4 41 55.63	2.2198	22 3 52.6	7.005
6	4 44 8.88	2.2218	22 10 49.4	6.887
7	4 46 22.25	2.2239	22 17 39.1	6.768
8	4 48 35.75	2.2260	22 24 21.6	6.649
9	4 50 49.37	2.2280	22 30 57.0	6.530
10	4 53 3.11	2.2299	22 37 25.2	6.410
11	4 55 16.96	2.2318	22 43 46.2	6.290
12	4 57 30.93	2.2337	22 50 0.0	6.169
13	4 59 45.01	2.2356	22 56 6.5	6.048
14	5 1 59.20	2.2374	23 2 5.7	5.926
15	5 4 13.49	2.2391	23 7 57.6	5.803
16	5 6 27.89	2.2408	23 13 42.1	5.680
17	5 8 42.39	2.2425	23 19 19.2	5.557
18	5 10 56.99	2.2442	23 24 48.9	5.433
19	5 13 11.69	2.2457	23 30 11.1	5.308
20	5 15 26.48	2.2472	23 35 25.9	5.184
21	5 17 41.36	2.2487	23 40 33.2	5.059
22	5 19 56.33	2.2502	23 45 33.0	4.933
23	5 22 11.38	2.2516	23 50 25.2	4.808
24	5 24 26.52	2.2530	N.23 55 9.9	4.682

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 24 26.52	2.2530	N.23 55 9.9	4.682
1	5 26 41.74	2.2542	23 59 47.0	4.555
2	5 28 57.03	2.2554	24 4 16.5	4.428
3	5 31 12.39	2.2566	24 8 38.4	4.301
4	5 33 27.82	2.2577	24 12 52.6	4.174
5	5 35 43.31	2.2588	24 16 59.2	4.046
6	5 37 58.87	2.2598	24 20 58.1	3.917
7	5 40 14.49	2.2607	24 24 49.3	3.789
8	5 42 30.16	2.2616	24 28 32.8	3.661
9	5 44 45.88	2.2624	24 32 8.6	3.532
10	5 47 1.65	2.2632	24 35 36.7	3.403
11	5 49 17.46	2.2638	24 38 57.0	3.273
12	5 51 33.31	2.2644	24 42 9.5	3.143
13	5 53 49.19	2.2650	24 45 14.2	3.014
14	5 56 5.11	2.2656	24 48 11.2	2.885
15	5 58 21.06	2.2660	24 51 0.4	2.755
16	6 0 37.03	2.2663	24 53 41.8	2.625
17	6 2 53.01	2.2665	24 56 15.4	2.494
18	6 5 9.01	2.2667	24 58 41.1	2.363
19	6 7 25.02	2.2669	25 0 59.0	2.233
20	6 9 41.04	2.2670	25 3 9.1	2.103
21	6 11 57.06	2.2670	25 5 11.4	1.972
22	6 14 13.08	2.2669	25 7 5.8	1.842
23	6 16 29.09	2.2668	N.25 8 52.4	1.711

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 18 45.10	2.2666	N.25 10 31.1	1.580
1	6 21 1.09	2.2663	25 12 2.0	1.450
2	6 23 17.06	2.2660	25 13 25.1	1.319
3	6 25 33.01	2.2656	25 14 40.3	1.188
4	6 27 48.93	2.2651	25 15 47.7	1.058
5	6 30 4.82	2.2645	25 16 47.3	0.928
6	6 32 20.67	2.2638	25 17 39.1	0.798
7	6 34 36.48	2.2631	25 18 23.1	0.667
8	6 36 52.24	2.2624	25 18 59.2	0.537
9	6 39 7.96	2.2616	25 19 27.5	0.407
10	6 41 23.63	2.2606	25 19 48.0	0.277
11	6 43 39.23	2.2595	25 20 0.8	0.148
12	6 45 54.77	2.2584	25 20 5.8	+ 0.018
13	6 48 10.24	2.2573	25 20 3.0	− 0.112
14	6 50 25.64	2.2561	25 19 52.4	0.241
15	6 52 40.97	2.2548	25 19 34.1	0.369
16	6 54 56.22	2.2534	25 19 8.1	0.498
17	6 57 11.38	2.2519	25 18 34.4	0.627
18	6 59 26.45	2.2504	25 17 52.9	0.756
19	7 1 41.43	2.2488	25 17 3.7	0.883
20	7 3 56.31	2.2472	25 16 6.9	1.010
21	7 6 11.09	2.2455	25 15 2.5	1.138
22	7 8 25.77	2.2437	25 13 50.4	1.265
23	7 10 40.33	2.2418	25 12 30.7	1.391
24	7 12 54.78	2.2398	N.25 11 3.5	1.517

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 12 54.78	2.2398	N.25 11 3.5	1.517
1	7 15 9.11	2.2378	25 9 28.7	1.643
2	7 17 23.32	2.2357	25 7 46.3	1.769
3	7 19 37.40	2.2336	25 5 56.4	1.894
4	7 21 51.35	2.2314	25 3 59.0	2.019
5	7 24 5.17	2.2292	25 1 54.1	2.143
6	7 26 18.85	2.2268	24 59 41.8	2.267
7	7 28 32.39	2.2244	24 57 22.1	2.390
8	7 30 45.78	2.2219	24 54 55.0	2.513
9	7 32 59.02	2.2193	24 52 20.5	2.636
10	7 35 12.10	2.2168	24 49 38.7	2.758
11	7 37 25.03	2.2142	24 46 49.6	2.879
12	7 39 37.80	2.2114	24 43 53.2	3.000
13	7 41 50.40	2.2087	24 40 49.6	3.120
14	7 44 2.84	2.2059	24 37 38.8	3.240
15	7 46 15.11	2.2030	24 34 20.8	3.360
16	7 48 27.20	2.2001	24 30 55.6	3.479
17	7 50 39.12	2.1972	24 27 23.3	3.597
18	7 52 50.86	2.1941	24 23 43.9	3.715
19	7 55 2.41	2.1910	24 19 57.5	3.832
20	7 57 13.78	2.1879	24 16 4.1	3.948
21	7 59 24.96	2.1847	24 12 3.7	4.064
22	8 1 35.95	2.1815	24 7 56.4	4.179
23	8 3 46.74	2.1782	N.24 3 42.2	4.294

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 5 57.33	2.1748	N.23 59 21.1	4.408
1	8 8 7.72	2.1715	23 54 53.2	4.522
2	8 10 17.91	2.1681	23 50 18.5	4.634
3	8 12 27.89	2.1647	23 45 37.1	4.746
4	8 14 37.67	2.1612	23 40 49.0	4.857
5	8 16 47.23	2.1576	23 35 54.3	4.968
6	8 18 56.58	2.1540	23 30 52.9	5.078
7	8 21 5.71	2.1504	23 25 44.9	5.187
8	8 23 14.63	2.1468	23 20 30.4	5.295
9	8 25 23.33	2.1431	23 15 9.5	5.403
10	8 27 31.81	2.1394	23 9 42.1	5.510
11	8 29 40.06	2.1357	23 4 8.3	5.616
12	8 31 48.09	2.1319	22 58 28.2	5.721
13	8 33 55.89	2.1281	22 52 41.8	5.826
14	8 36 3.46	2.1244	22 46 49.1	5.931
15	8 38 10.81	2.1206	22 40 50.1	6.035
16	8 40 17.93	2.1167	22 34 44.9	6.137
17	8 42 24.81	2.1127	22 28 33.6	6.239
18	8 44 31.45	2.1087	22 22 16.2	6.341
19	8 46 37.86	2.1048	22 15 52.7	6.441
20	8 48 44.03	2.1009	22 9 23.3	6.539
21	8 50 49.97	2.0970	22 2 48.0	6.638
22	8 52 55.67	2.0930	21 56 6.8	6.736
23	8 55 1.13	2.0890	21 49 19.7	6.833
24	8 57 6.35	2.0850	N.21 42 26.8	6.930

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.			
	h m s	s	° ′ ″	″
0	8 57 6.35	2.0850	N.21 42 26.8	6.930
1	8 59 11.33	2.0810	21 35 28.1	7.025
2	9 1 16.07	2.0769	21 28 23.8	7.119
3	9 3 20.56	2.0728	21 21 13.8	7.213
4	9 5 24.81	2.0688	21 13 58.2	7.307
5	9 7 28.82	2.0647	21 6 37.0	7.399
6	9 9 32.58	2.0607	20 59 10.3	7.491
7	9 11 36.10	2.0566	20 51 38.1	7.582
8	9 13 39.37	2.0525	20 44 0.5	7.671
9	9 15 42.40	2.0485	20 36 17.6	7.760
10	9 17 45.19	2.0444	20 28 29.3	7.849
11	9 19 47.73	2.0403	20 20 35.7	7.936
12	9 21 50.03	2.0362	20 12 37.0	8.022
13	9 23 52.08	2.0322	20 4 33.1	8.108
14	9 25 53.89	2.0282	19 56 24.1	8.193
15	9 27 55.46	2.0242	19 48 9.9	8.278
16	9 29 56.79	2.0201	19 39 50.7	8.361
17	9 31 57.87	2.0160	19 31 26.6	8.443
18	9 33 58.71	2.0120	19 22 57.6	8.524
19	9 35 59.31	2.0080	19 14 23.7	8.605
20	9 37 59.67	2.0040	19 5 45.0	8.685
21	9 39 59.79	2.0000	18 57 1.5	8.764
22	9 41 59.67	1.9960	18 48 13.3	8.842
23	9 43 59.31	1.9920	N.18 39 20.4	8.920
	MONDAY 26.			
0	9 45 58.71	1.9881	N.18 30 22.9	8.997
1	9 47 57.88	1.9842	18 21 20.8	9.072
2	9 49 56.81	1.9803	18 12 14.2	9.147
3	9 51 55.51	1.9764	18 3 3.1	9.222
4	9 53 53.98	1.9725	17 53 47.6	9.295
5	9 55 52.21	1.9686	17 44 27.7	9.367
6	9 57 50.21	1.9648	17 35 3.5	9.430
7	9 59 47.98	1.9610	17 25 35.0	9.510
8	10 1 45.53	1.9573	17 16 2.3	9.580
9	10 3 42.86	1.9536	17 6 25.4	9.649
10	10 5 39.96	1.9498	16 56 44.4	9.717
11	10 7 36.84	1.9461	16 46 59.3	9.785
12	10 9 33.49	1.9424	16 37 10.2	9.852
13	10 11 29.92	1.9388	16 27 17.1	9.918
14	10 13 26.14	1.9352	16 17 20.1	9.983
15	10 15 22.15	1.9317	16 7 19.1	10.048
16	10 17 17.94	1.9281	15 57 14.3	10.111
17	10 19 13.52	1.9245	15 47 5.8	10.174
18	10 21 8.88	1.9210	15 36 53.5	10.236
19	10 23 4.04	1.9176	15 26 37.5	10.297
20	10 24 58.99	1.9142	15 16 17.9	10.357
21	10 26 53.74	1.9108	15 5 54.6	10.417
22	10 28 48.29	1.9075	14 55 27.8	10.476
23	10 30 42.64	1.9042	14 44 57.5	10.533
24	10 32 36.80	1.9010	N.14 34 23.8	10.590

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 27.			
	h m s	s	° ′ ″	″
0	10 32 36.80	1.9010	N.14 34 23.8	10.590
1	10 34 30.76	1.8978	14 23 46.7	10.647
2	10 36 24.53	1.8946	14 13 6.2	10.703
3	10 38 18.11	1.8914	14 2 22.3	10.758
4	10 40 11.50	1.8882	13 51 35.2	10.812
5	10 42 4.70	1.8852	13 40 44.9	10.866
6	10 43 57.72	1.8822	13 29 51.3	10.918
7	10 45 50.56	1.8792	13 18 54.6	10.970
8	10 47 43.22	1.8762	13 7 54.9	11.021
9	10 49 35.71	1.8734	12 56 52.1	11.072
10	10 51 28.03	1.8706	12 45 46.3	11.122
11	10 53 20.18	1.8678	12 34 37.5	11.171
12	10 55 12.16	1.8650	12 23 25.8	11.218
13	10 57 3.98	1.8623	12 12 11.3	11.265
14	10 58 55.64	1.8596	12 0 54.0	11.312
15	11 0 47.13	1.8569	11 49 33.8	11.359
16	11 2 38.47	1.8544	11 38 10.9	11.403
17	11 4 29.66	1.8520	11 26 45.4	11.447
18	11 6 20.71	1.8496	11 15 17.2	11.491
19	11 8 11.61	1.8471	11 3 46.4	11.534
20	11 10 2.36	1.8447	10 52 13.1	11.576
21	11 11 52.97	1.8423	10 40 37.3	11.618
22	11 13 43.44	1.8401	10 28 59.0	11.659
23	11 15 33.78	1.8379	N.10 17 18.2	11.700
	WEDNESDAY 28.			
0	11 17 23.99	1.8358	N.10 5 35.0	11.739
1	11 19 14.07	1.8337	9 53 49.5	11.778
2	11 21 4.03	1.8316	9 42 1.7	11.816
3	11 22 53.86	1.8296	9 30 11.6	11.853
4	11 24 43.58	1.8277	9 18 19.3	11.889
5	11 26 33.18	1.8258	9 6 24.9	11.924
6	11 28 22.67	1.8239	8 54 28.4	11.959
7	11 30 12.05	1.8222	8 42 29.8	11.994
8	11 32 1.33	1.8204	8 30 29.1	12.028
9	11 33 50.50	1.8187	8 18 26.4	12.062
10	11 35 39.57	1.8171	8 6 21.7	12.094
11	11 37 28.55	1.8156	7 54 15.1	12.126
12	11 39 17.44	1.8141	7 42 6.6	12.157
13	11 41 6.24	1.8127	7 29 56.2	12.187
14	11 42 54.96	1.8113	7 17 44.1	12.217
15	11 44 43.60	1.8100	7 5 30.2	12.246
16	11 46 32.16	1.8087	6 53 14.6	12.274
17	11 48 20.64	1.8074	6 40 57.3	12.302
18	11 50 9.05	1.8063	6 28 38.3	12.330
19	11 51 57.40	1.8053	6 16 17.7	12.356
20	11 53 45.69	1.8042	6 3 55.6	12.381
21	11 55 33.91	1.8032	5 51 32.0	12.406
22	11 57 22.08	1.8024	5 39 6.9	12.430
23	11 59 10.20	1.8016	5 26 40.4	12.454
24	12 0 58.27	1.8008	N. 5 14 12.4	12.477

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 0 58.27	1.8006	N. 5 14 12.4	12.477
1	12 2 46.30	1.8001	5 1 43.1	12.499
2	12 4 34.28	1.7993	4 49 12.5	12.521
3	12 6 22.22	1.7987	4 36 40.5	12.543
4	12 8 10.13	1.7983	4 24 7.3	12.563
5	12 9 58.02	1.7979	4 11 32.9	12.583
6	12 11 45.88	1.7975	3 58 57.4	12.602
7	12 13 33.72	1.7972	3 46 20.7	12.621
8	12 15 21.54	1.7969	3 33 42.9	12.638
9	12 17 9.34	1.7969	3 21 4.1	12.655
10	12 18 57.13	1.7965	3 8 24.3	12.672
11	12 20 44.92	1.7965	2 55 43.5	12.688
12	12 22 32.71	1.7965	2 43 1.7	12.704
13	12 24 20.50	1.7965	2 30 19.0	12.718
14	12 26 8.29	1.7966	2 17 35.5	12.732
15	12 27 56.09	1.7968	2 4 51.2	12.745
16	12 29 43.91	1.7971	1 52 6.1	12.757
17	12 31 31.74	1.7974	1 39 20.3	12.769
18	12 33 19.59	1.7977	1 26 33.8	12.781
19	12 35 7.47	1.7982	1 13 46.6	12.792
20	12 36 55.38	1.7987	1 0 58.8	12.801
21	12 38 43.32	1.7993	0 48 10.5	12.810
22	12 40 31.30	1.8000	0 35 21.6	12.819
23	12 42 19.32	1.8007	N. 0 22 32.2	12.827

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 44 7.38	1.8014	N. 0 9 42.3	12.836
1	12 45 55.49	1.8023	S. 0 3 8.0	12.842
2	12 47 43.66	1.8033	0 15 58.7	12.847
3	12 49 31.89	1.8043	0 28 49.7	12.852
4	12 51 20.18	1.8054	0 41 41.0	12.857
5	12 53 8.54	1.8066	0 54 32.6	12.862
6	12 54 56.97	1.8078	1 7 24.4	12.865
7	12 56 45.47	1.8090	1 20 16.4	12.867
8	12 58 34.05	1.8104	1 33 8.5	12.869
9	13 0 22.72	1.8118	1 46 0.7	12.871
10	13 2 11.47	1.8132	1 58 53.0	12.872
11	13 4 0.31	1.8148	2 11 45.3	12.872
12	13 5 49.25	1.8165	2 24 37.6	12.871
13	13 7 38.29	1.8183	2 37 29.8	12.869
14	13 9 27.44	1.8201	2 50 21.9	12.867
15	13 11 16.70	1.8219	3 3 13.9	12.865
16	13 13 6.07	1.8237	3 16 5.7	12.861
17	13 14 55.55	1.8257	3 28 57.2	12.857
18	13 16 45.15	1.8278	3 41 48.5	12.852
19	13 18 34.88	1.8300	3 54 39.5	12.847
20	13 20 24.75	1.8322	4 7 30.1	12.840
21	13 22 14.75	1.8345	4 20 20.3	12.832
22	13 24 4.89	1.8369	4 33 10.0	12.824
23	13 25 55.18	1.8393	4 45 59.2	12.816
24	13 27 45.61	1.8418	S. 4 58 47.9	12.807

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 27 45.61	1.8418	S. 4 58 47.9	12.807
1	13 29 36.20	1.8445	5 11 36.1	12.797
2	13 31 26.95	1.8471	5 24 23.6	12.786
3	13 33 17.85	1.8498	5 37 10.4	12.774
4	13 35 8.92	1.8526	5 49 56.5	12.762
5	13 37 0.16	1.8555	6 2 41.9	12.750
6	13 38 51.58	1.8585	6 15 26.5	12.736
7	13 40 43.18	1.8615	6 28 10.2	12.721
8	13 42 34.96	1.8646	6 40 53.0	12.706
9	13 44 26.93	1.8677	6 53 34.9	12.690
10	13 46 19.09	1.8710	7 6 15.8	12.673
11	13 48 11.45	1.8744	7 18 55.6	12.655
12	13 50 4.02	1.8778	7 31 34.4	12.637
13	13 51 56.79	1.8812	7 44 12.1	12.617
14	13 53 49.77	1.8848	7 56 48.5	12.597
15	13 55 42.97	1.8885	8 9 23.7	12.576
16	13 57 36.39	1.8922	8 21 57.6	12.554
17	13 59 30.03	1.8959	8 34 30.2	12.532
18	14 1 23.90	1.8998	8 47 1.4	12.508
19	14 3 18.01	1.9037	8 59 31.2	12.483
20	14 5 12.35	1.9077	9 11 59.4	12.458
21	14 7 6.93	1.9118	9 24 26.1	12.432
22	14 9 1.76	1.9160	9 36 51.2	12.405
23	14 10 56.85	1.9202	S. 9 49 14.7	12.377

SUNDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 12 52.19	1.9245	S. 10 1 36.5	12.348

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter	Jan.	2	22	12.1
● New Moon		10	3	24.6
☽ First Quarter		16	18	17.5
○ Full Moon		24	12	25.3

		d	h
☾ Perigee	Jan.	11	13.8
☾ Apogee		27	3.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	57° 38′ 6″	3076	59° 6′ 45″	3071	60° 35′ 30″	3066	62° 4′ 21″	3061
	Regulus	W.	21 50 43	3160	23 17 40	3145	24 44 55	3132	26 12 26	3119
	Spica	E.	33 24 19	3153	31 57 13	3156	30 30 11	3160	29 3 14	3164
	Venus	E.	75 35 52	3183	74 9 22	3181	72 42 50	3178	71 16 15	3174
	Antares	E.	79 3 55	3083	77 35 25	3078	76 6 49	3074	74 38 8	3069
	Sun	E.	111 4 28	3457	109 43 16	3454	108 22 0	3448	107 0 38	3443
2	Pollux	W.	69 30 23	3027	71 0 2	3020	72 29 50	3011	73 59 49	3002
	Regulus	W.	33 33 40	3062	35 2 36	3052	36 31 45	3040	38 1 8	3029
	Venus	E.	64 2 5	3151	62 34 57	3145	61 7 42	3138	59 40 19	3131
	Antares	E.	67 13 3	3039	65 43 38	3032	64 14 5	3024	62 44 22	3016
	Sun	E.	100 12 4	3408	98 49 56	3400	97 27 39	3390	96 5 11	3380
3	Pollux	W.	81 32 42	2950	83 3 57	2939	84 35 26	2927	86 7 11	2915
	Regulus	W.	45 31 38	2969	47 2 30	2956	48 33 38	2942	50 5 3	2930
	Saturn	W.	26 38 47	2970	28 9 37	2955	29 40 46	2942	31 12 12	2927
	Venus	E.	52 21 4	3089	50 52 41	3080	49 24 7	3070	47 55 21	3060
	Antares	E.	55 13 3	2969	53 42 11	2958	52 11 5	2947	50 39 46	2936
	Sun	E.	89 9 56	3325	87 46 13	3313	86 22 16	3300	84 58 4	3287
4	Pollux	W.	93 50 2	2846	95 23 30	2831	96 57 17	2816	98 31 24	2801
	Regulus	W.	57 46 30	2857	59 19 44	2842	60 53 18	2826	62 27 12	2810
	Saturn	W.	38 54 7	2850	40 27 30	2835	42 1 13	2818	43 35 18	2801
	Venus	E.	40 28 10	3003	38 58 1	2992	37 27 38	2979	35 56 59	2967
	Antares	E.	42 59 31	2876	41 26 42	2864	39 53 37	2852	38 20 16	2838
	Sun	E.	77 52 57	3212	76 27 2	3196	75 0 48	3180	73 34 15	3163
5	Regulus	W.	70 22 5	2725	71 58 11	2708	73 34 40	2690	75 11 33	2672
	Saturn	W.	51 31 10	2716	53 7 29	2698	54 44 12	2680	56 21 19	2662
	Spica	W.	17 7 56	2992	18 38 19	2932	20 9 57	2881	21 42 40	2836
	Venus	E.	28 19 57	2909	26 47 50	2898	25 15 29	2889	23 42 56	2880
	Sun	E.	66 16 17	3074	64 47 36	3056	63 18 32	3038	61 49 6	3018
6	Regulus	W.	83 22 6	2580	85 1 28	2562	86 41 15	2543	88 21 28	2525
	Saturn	W.	64 33 6	2569	66 12 44	2550	67 52 48	2532	69 33 17	2512
	Spica	W.	29 39 8	2666	31 16 33	2638	32 54 36	2612	34 33 15	2587
	Sun	E.	54 15 54	2921	52 44 2	2901	51 11 45	2882	49 39 3	2862
7	Regulus	W.	96 49 2	2432	98 31 51	2415	100 15 5	2396	101 58 45	2379
	Spica	W.	42 54 49	2472	44 36 42	2450	46 19 6	2429	48 2 0	2409
	Sun	E.	41 49 15	2766	40 14 3	2747	38 38 26	2729	37 2 25	2710
8	Spica	W.	56 43 30	2314	58 29 9	2296	60 15 14	2280	62 1 43	2263
	Sun	E.	28 56 30	2629	27 18 14	2615	25 39 40	2602	24 0 48	2591
11	Sun	W.	12 33 44	2454	14 16 2	2434	15 58 48	2417	17 41 59	2402
	α Pegasi	E.	53 28 57	2729	51 52 56	2764	50 17 41	2804	48 43 18	2849
	α Arietis	E.	93 46 17	2153	91 56 39	2151	90 6 58	2150	88 17 15	2149
12	Sun	W.	26 21 25	2377	28 5 33	2378	29 49 39	2380	31 33 42	2384
	α Arietis	E.	79 9 1	2163	77 19 37	2168	75 30 21	2174	73 41 15	2181
	Aldebaran	E.	109 36 21	2060	107 44 20	2064	105 52 25	2068	104 0 36	2072

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
1	Pollux	W.	63° 33′ 18″	3056	65° 2′ 22″	3049	66° 31′ 34″	3043	68° 0′ 54″	3035
	Regulus	W.	27 40 13	3107	29 8 14	3096	30 36 29	3084	32 4 58	3073
	Spica	E.	27 36 22	3171	26 9 38	3178	24 43 3	3189	23 16 41	3204
	Venus	E.	69 49 35	3171	68 22 51	3166	66 56 1	3162	65 29 6	3157
	Antares	E.	73 9 21	3064	71 40 27	3059	70 11 27	3052	68 42 19	3046
	Sun	E.	105 39 10	3437	104 17 35	3431	102 55 53	3423	101 34 3	3415
2	Pollux	W.	75 29 59	2993	77 0 21	2983	78 30 55	2973	80 1 42	2962
	Regulus	W.	39 30 45	3018	41 0 36	3005	42 30 42	2994	44 1 2	2981
	Venus	E.	58 12 47	3124	56 45 6	3116	55 17 16	3107	53 49 15	3099
	Antares	E.	61 14 29	3007	59 44 25	2998	58 14 10	2989	56 43 43	2978
	Sun	E.	94 42 32	3371	93 19 42	3359	91 56 39	3349	90 33 24	3338
3	Pollux	W.	87 39 11	2901	89 11 28	2888	90 44 2	2875	92 16 53	2861
	Regulus	W.	51 36 44	2916	53 8 43	2901	54 41 0	2887	56 13 35	2872
	Saturn	W.	32 43 57	2912	34 16 0	2897	35 48 23	2882	37 21 5	2866
	Venus	E.	46 26 22	3049	44 57 10	3038	43 27 44	3026	41 58 4	3015
	Antares	E.	49 8 13	2924	47 36 25	2912	46 4 22	2901	44 32 4	2889
	Sun	E.	83 33 37	3272	82 8 53	3258	80 43 52	3242	79 18 33	3228
4	Pollux	W.	100 5 51	2785	101 40 38	2769	103 15 47	2753	104 51 17	2735
	Regulus	W.	64 1 27	2793	65 36 4	2777	67 11 2	2760	68 46 22	2743
	Saturn	W.	45 9 44	2785	46 44 32	2768	48 19 42	2750	49 55 15	2734
	Venus	E.	34 26 5	2954	32 54 55	2942	31 23 30	2931	29 51 50	2920
	Antares	E.	36 46 38	2826	35 12 44	2815	33 38 35	2803	32 4 11	2792
	Sun	E.	72 7 22	3146	70 40 8	3128	69 12 32	3111	67 44 36	3092
5	Regulus	W.	76 48 51	2654	78 26 33	2636	80 4 39	2618	81 43 10	2599
	Saturn	W.	57 58 50	2643	59 36 46	2625	61 15 7	2606	62 53 54	2588
	Spica	W.	23 16 21	2795	24 50 55	2760	26 26 16	2725	28 2 22	2695
	Venus	E.	22 10 11	2873	20 37 18	2869	19 4 20	2871	17 31 24	2882
	Sun	E.	60 19 16	2998	58 49 1	2980	57 18 23	2961	55 47 21	2941
6	Regulus	W.	90 2 7	2506	91 43 12	2487	93 24 43	2469	95 6 40	2451
	Saturn	W.	71 14 13	2494	72 55 35	2475	74 37 23	2456	76 19 38	2438
	Spica	W.	36 12 28	2562	37 52 15	2538	39 32 35	2516	41 13 26	2493
	Sun	E.	48 5 55	2843	46 32 23	2824	44 58 26	2804	43 24 3	2785
7	Regulus	W.	103 42 50	2361	105 27 21	2344	107 12 16	2327	108 57 36	2311
	Spica	W.	49 45 22	2389	51 29 13	2370	53 13 31	2350	54 58 17	2332
	Sun	E.	35 25 59	2694	33 49 10	2676	32 11 58	2660	30 34 25	2644
8	Spica	W.	63 48 37	2247	65 35 54	2232	67 23 34	2217	69 11 36	2202
	Sun	E.	22 21 40	2580	20 42 18	2573	19 2 46	2567	17 23 6	2564
11	Sun	W.	19 25 31	2392	21 9 17	2384	22 53 14	2380	24 37 18	2378
	α Pegasi	E.	47 9 54	2901	45 37 36	2959	44 6 32	3026	42 36 51	3102
	α Arietis	E.	86 27 31	2150	84 37 48	2152	82 48 8	2155	80 58 32	2158
12	Sun	W.	33 17 40	2388	35 1 32	2392	36 45 18	2398	38 28 56	2405
	α Arietis	E.	71 52 19	2190	70 3 36	2198	68 15 6	2208	66 26 51	2220
	Aldebaran	E.	102 8 54	2078	100 17 21	2083	98 25 56	2090	96 34 41	2097

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
13	Sun	W.	40° 12′ 24″	2412	41° 55′ 42″	2420	43° 38′ 48″	2429	45° 21′ 42″	2438
	α Arietis	E.	64 38 53	2232	62 51 13	2245	61 3 52	2259	59 16 52	2274
	Aldebaran	E.	94 43 37	2105	92 52 45	2113	91 2 5	2122	89 11 39	2131
14	Sun	W.	53 52 40	2492	55 34 5	2504	57 15 12	2516	58 56 3	2530
	α Arietis	E.	50 28 4	2368	48 43 44	2391	46 59 57	2417	45 16 46	2443
	Aldebaran	E.	80 3 13	2184	78 14 21	2196	76 25 47	2208	74 37 32	2220
15	Sun	W.	67 15 38	2599	68 54 35	2612	70 33 13	2627	72 11 31	2641
	Fomalhaut	W.	33 16 56	2876	34 49 46	2837	36 23 26	2806	37 57 46	2780
	Aldebaran	E.	65 41 2	2287	63 54 44	2301	62 8 46	2315	60 23 9	2331
16	Sun	W.	80 18 2	2717	81 54 19	2732	83 30 17	2747	85 5 54	2762
	Fomalhaut	W.	45 55 48	2716	47 32 6	2712	49 8 30	2710	50 44 57	2709
	α Pegasi	W.	33 48 21	4064	34 58 58	3936	36 11 41	3826	37 26 16	3731
	Aldebaran	E.	51 40 27	2405	49 57 0	2420	48 13 54	2436	46 31 10	2452
	Pollux	E.	95 46 22	2387	94 2 28	2400	92 18 53	2414	90 35 38	2428
17	Sun	W.	92 59 6	2836	94 32 47	2852	96 6 8	2866	97 39 10	2880
	Fomalhaut	W.	58 46 49	2725	60 22 56	2730	61 58 56	2736	63 34 48	2744
	α Pegasi	W.	44 0 18	3418	45 22 14	3379	46 44 54	3345	48 8 13	3316
	Aldebaran	E.	38 3 10	2533	36 22 43	2550	34 42 39	2568	33 3 0	2587
	Pollux	E.	82 4 19	2497	80 23 2	2510	78 42 3	2524	77 1 23	2538
18	Sun	W.	105 19 49	2951	106 51 3	2964	108 22 1	2977	109 52 42	2991
	Fomalhaut	W	71 31 36	2784	73 6 25	2793	74 41 2	2802	76 15 27	2811
	α Pegasi	W.	55 11 56	3221	56 37 40	3209	58 3 38	3201	59 29 46	3193
	Pollux	E.	68 42 38	2602	67 3 46	2615	65 25 11	2627	63 46 53	2639
	Regulus	E.	104 48 44	2607	103 9 59	2619	101 31 30	2631	99 53 17	2643
19	Sun	W.	117 22 2	3055	118 51 7	3067	120 19 57	3078	121 48 33	3091
	Fomalhaut	W.	84 4 25	2861	85 37 34	2871	87 10 30	2881	88 43 13	2891
	α Pegasi	W.	66 42 9	3177	68 8 46	3176	69 35 24	3177	71 2 1	3178
	Pollux	E.	55 39 26	2698	54 2 44	2710	52 26 17	2721	50 50 5	2732
	Regulus	E.	91 46 10	2700	90 9 30	2710	88 33 4	2721	86 56 52	2732
20	α Pegasi	W.	78 14 24	3195	79 40 39	3200	81 6 48	3206	82 32 50	3211
	α Arietis	W.	34 37 19	3129	36 4 53	3112	37 32 48	3098	39 1 0	3086
	Pollux	E.	42 52 42	2786	41 17 56	2796	39 43 23	2807	38 9 4	2818
	Regulus	E.	78 59 18	2782	77 24 26	2792	75 49 47	2801	74 15 20	2810
21	α Arietis	W.	46 24 46	3056	47 53 50	3053	49 22 57	3052	50 52 6	3050
	Pollux	E.	30 20 56	2871	28 48 0	2883	27 15 20	2895	25 42 55	2909
	Regulus	E.	66 26 1	2854	64 52 43	2862	63 19 36	2871	61 46 40	2879
22	α Arietis	W.	58 17 54	3055	59 46 59	3056	61 16 2	3059	62 45 2	3062
	Aldebaran	W.	26 56 42	2973	28 27 28	2974	29 58 13	2975	31 28 57	2976
	Regulus	E.	54 4 33	2919	52 32 38	2926	51 0 52	2935	49 29 17	2942
	Spica	E.	108 7 14	2924	106 35 26	2931	105 3 47	2938	103 32 16	2944
23	α Arietis	W.	70 9 7	3078	71 37 44	3081	73 6 17	3085	74 34 45	3089
	Aldebaran	W.	39 2 0	2989	40 32 26	2993	42 2 47	2997	43 33 3	3001

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Sun	W.	47° 4′ 23″	2448	48° 46′ 49″	2458	50° 29′ 2″	2469	52° 10′ 59″	2480
	α Arietis	E.	57 30 15	2291	55 44 2	2309	53 58 15	2327	52 12 55	2347
	Aldebaran	E.	87 21 27	2141	85 31 30	2151	83 41 48	2161	81 52 22	2172
14	Sun	W.	60 36 35	2543	62 16 49	2556	63 56 44	2570	65 36 20	2583
	α Arietis	E.	43 34 13	2472	41 52 21	2504	40 11 14	2538	38 30 54	2574
	Aldebaran	E.	72 49 35	2233	71 1 57	2247	69 14 39	2260	67 27 41	2273
15	Sun	W.	73 49 30	2657	75 27 8	2672	77 4 26	2687	78 41 24	2701
	Fomalhaut	W.	39 32 40	2760	41 8 0	2744	42 43 41	2732	44 19 38	2722
	Aldebaran	E.	58 37 54	2345	56 53 0	2359	55 8 27	2375	53 24 16	2390
16	Sun	W.	86 41 12	2777	88 16 10	2792	89 50 48	2807	91 25 7	2822
	Fomalhaut	W.	52 21 25	2710	53 57 52	2712	55 34 16	2716	57 10 35	2719
	α Pegasi	W.	38 42 30	3649	40 0 11	3578	41 19 9	3517	42 39 14	3464
	Aldebaran	E.	44 48 49	2467	43 6 50	2484	41 25 14	2499	39 44 0	2517
	Pollux	E.	88 52 43	2442	87 10 8	2455	85 27 52	2470	83 45 56	2483
17	Sun	W.	99 11 54	2894	100 44 20	2909	102 16 27	2923	103 48 17	2937
	Fomalhaut	W.	65 10 30	2750	66 46 3	2759	68 21 25	2767	69 56 36	2775
	α Pegasi	W.	49 32 6	3290	50 56 29	3269	52 21 17	3250	53 46 27	3234
	Aldebaran	E.	31 23 47	2606	29 45 0	2626	28 6 40	2646	26 28 48	2667
	Pollux	E.	75 21 2	2551	73 40 59	2564	72 1 14	2577	70 21 47	2590
18	Sun	W.	111 23 6	3005	112 53 13	3017	114 23 5	3030	115 52 41	3042
	Fomalhaut	W.	77 49 40	2821	79 23 40	2831	80 57 28	2841	82 31 3	2851
	α Pegasi	W.	60 56 4	3187	62 22 29	3183	63 48 59	3179	65 15 33	3176
	Pollux	E.	62 8 51	2652	60 31 6	2663	58 53 37	2675	57 16 24	2687
	Regulus	E.	98 15 21	2655	96 37 40	2666	95 0 15	2678	93 23 5	2689
19	Sun	W.	123 16 54	3102	124 45 1	3114	126 12 54	3125	127 40 33	3137
	Fomalhaut	W.	90 15 43	2901	91 48 0	2912	93 20 4	2923	94 51 54	2933
	α Pegasi	W.	72 28 37	3180	73 55 10	3183	75 21 39	3187	76 48 4	3191
	Pollux	E.	49 14 8	2743	47 38 25	2754	46 2 57	2764	44 27 42	2775
	Regulus	E.	85 20 54	2742	83 45 10	2753	82 9 40	2763	80 34 23	2772
20	α Pegasi	W.	83 58 46	3918	85 24 34	3925	86 50 14	3932	88 15 45	3939
	α Arietis	W.	40 29 27	3077	41 58 5	3069	43 26 52	3064	44 55 46	3059
	Pollux	E.	36 34 59	2828	35 1 8	2838	33 27 30	2849	31 54 6	2860
	Regulus	E.	72 41 5	2819	71 7 2	2828	69 33 10	2837	67 59 30	2845
21	α Arietis	W.	52 21 17	3050	53 50 28	3051	55 19 38	3052	56 48 47	3053
	Pollux	E.	24 10 47	2922	22 38 56	2937	21 7 24	2952	19 36 11	2969
	Regulus	E.	60 13 54	2887	58 41 18	2895	57 8 53	2903	55 36 38	2911
22	α Arietis	W.	64 13 58	3065	65 42 51	3068	67 11 40	3070	68 40 26	3074
	Aldebaran	W.	32 59 40	2978	34 30 20	2981	36 0 57	2984	37 31 30	2986
	Regulus	E.	47 57 51	2950	46 26 35	2958	44 55 29	2965	43 24 32	2973
	Spica	E.	102 0 53	2950	100 29 38	2956	98 58 30	2962	97 27 30	2969
23	α Arietis	W.	76 3 8	3093	77 31 26	3096	78 59 40	3101	80 27 48	3105
	Aldebaran	W.	45 3 15	3005	46 33 21	3009	48 3 23	3013	49 33 20	3017

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Regulus	E.	41° 53′ 45″	2981	40° 23′ 8″	2989	38° 52′ 41″	2997	37° 22′ 24″	3005
	Saturn	E.	60 1 26	2942	58 30 0	2948	56 58 42	2954	55 27 31	2959
	Spica	E.	95 56 38	2974	94 25 53	2980	92 55 15	2985	91 24 44	2992
24	α Arietis	W.	81 55 51	3110	83 23 49	3114	84 51 42	3119	86 19 29	3123
	Aldebaran	W.	51 3 12	3021	52 32 59	3025	54 2 41	3029	55 32 18	3033
	Regulus	E.	29 53 37	3050	28 24 26	3060	26 55 28	3073	25 26 45	3086
	Saturn	E.	47 53 26	2989	46 22 59	2993	44 52 38	2999	43 22 24	3004
	Spica	E.	83 53 56	3018	82 24 6	3024	80 54 23	3029	79 24 46	3034
25	Aldebaran	W.	62 59 12	3052	64 28 21	3055	65 57 26	3059	67 26 26	3062
	Pollux	W.	18 55 28	3103	20 23 34	3099	21 51 45	3096	23 20 0	3093
	Saturn	E.	35 52 53	3031	34 23 19	3036	32 53 51	3042	31 24 30	3047
	Spica	E.	71 58 12	3058	70 29 11	3062	69 0 15	3067	67 31 25	3071
26	Aldebaran	W.	74 50 30	3077	76 19 8	3079	77 47 43	3082	79 16 15	3083
	Pollux	W.	30 41 48	3089	32 10 11	3089	33 38 34	3090	35 6 56	3091
	Spica	E.	60 8 30	3091	58 40 10	3095	57 11 54	3098	55 43 42	3102
	Antares	E.	106 0 42	3077	104 32 4	3079	103 3 29	3082	101 34 57	3083
	Venus	E.	117 48 2	3401	116 25 47	3405	115 3 36	3408	113 41 28	3411
27	Aldebaran	W.	86 38 20	3092	88 6 39	3093	89 34 57	3094	91 3 14	3094
	Pollux	W.	42 28 37	3092	43 56 56	3093	45 25 14	3093	46 53 32	3092
	Spica	E.	48 23 48	3119	46 56 1	3122	45 28 18	3125	44 0 39	3129
	Antares	E.	94 12 51	3091	92 44 31	3093	91 16 13	3093	89 47 55	3094
	Venus	E.	106 51 34	3422	105 29 42	3423	104 7 52	3425	102 46 4	3426
28	Pollux	W.	54 15 13	3088	55 43 37	3087	57 12 2	3086	58 40 29	3083
	Regulus	W.	18 29 46	3202	19 55 53	3183	21 22 22	3169	22 49 8	3156
	Spica	E.	36 43 24	3146	35 16 10	3149	33 49 0	3154	32 21 56	3160
	Antares	E.	82 26 32	3094	80 58 15	3092	79 29 56	3091	78 1 36	3089
	Venus	E.	95 57 15	3428	94 35 30	3427	93 13 44	3426	91 51 57	3424
29	Pollux	W.	66 3 30	3069	67 32 18	3065	69 1 10	3060	70 30 8	3056
	Regulus	W.	30 6 18	3110	31 34 16	3102	33 2 23	3095	34 30 39	3087
	Antares	E.	70 39 18	3078	69 10 41	3074	67 42 0	3070	66 13 14	3067
	Venus	E.	85 2 33	3414	83 40 32	3411	82 18 28	3407	80 56 19	3403
	Sun	E.	131 1 39	3468	129 40 39	3463	128 19 33	3458	126 58 22	3453
30	Pollux	W.	77 56 32	3027	79 26 11	3021	80 55 58	3014	82 25 54	3006
	Regulus	W.	41 54 20	3048	43 23 33	3040	44 52 56	3031	46 22 30	3022
	Saturn	W.	23 58 33	3033	25 28 5	3022	26 57 50	3013	28 27 47	3002
	Antares	E.	58 48 5	3042	57 18 44	3035	55 49 15	3030	54 19 39	3023
	Venus	E.	74 4 19	3377	72 41 36	3371	71 18 46	3365	69 55 49	3357
	Sun	E.	120 10 47	3420	118 48 53	3412	117 26 50	3404	116 4 38	3396
31	Pollux	W.	89 58 5	2962	91 29 6	2952	93 0 19	2942	94 31 45	2931
	Regulus	W.	53 53 11	2974	55 23 56	2963	56 54 55	2952	58 26 8	2941
	Saturn	W.	36 0 45	2950	37 32 0	2939	39 3 30	2927	40 35 15	2916
	Antares	E.	46 49 28	2985	45 18 57	2977	43 48 15	2968	42 17 22	2960
	Venus	E.	62 58 47	3315	61 34 53	3305	60 10 47	3295	58 46 30	3285
	Sun	E.	109 11 5	3346	107 47 47	3336	106 24 17	3325	105 0 34	3313

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
23	Regulus	E.	35° 52′ 17″	3014	34° 22′ 21″	3022	32° 52′ 35″	3030	31° 23′ 0″	3040
	Saturn	E.	53 56 27	2965	52 25 31	2971	50 54 42	2977	49 24 0	2983
	Spica	E.	89 54 21	2997	88 24 5	3002	86 53 55	3008	85 23 52	3014
24	α Arietis	W.	87 47 11	3127	89 14 48	3132	90 42 19	3136	92 9 45	3140
	Aldebaran	W.	57 1 50	3037	58 31 17	3040	60 0 40	3044	61 29 58	3047
	Regulus	E.	23 58 18	3101	22 30 9	3116	21 2 19	3134	19 34 51	3154
	Saturn	E.	41 52 16	3009	40 22 15	3015	38 52 21	3021	37 22 34	3026
	Spica	E.	77 55 15	3039	76 25 50	3044	74 56 32	3048	73 27 19	3053
25	Aldebaran	W.	68 55 22	3065	70 24 14	3068	71 53 3	3071	73 21 48	3073
	Pollux	W.	24 48 18	3091	26 16 39	3090	27 45 1	3089	29 13 24	3088
	Saturn	E.	29 55 16	3053	28 26 9	3059	26 57 9	3065	25 28 17	3071
	Spica	E.	66 2 40	3075	64 34 0	3079	63 5 25	3083	61 36 55	3087
26	Aldebaran	W.	80 44 45	3086	82 13 12	3087	83 41 37	3090	85 9 59	3091
	Pollux	W.	36 35 17.	3091	38 3 38	3091	39 31 58	3091	41 0 18	3092
	Spica	E.	54 15 35	3105	52 47 32	3109	51 19 33	3113	49 51 39	3115
	Antares	E.	100 6 27	3086	98 38 0	3087	97 9 35	3089	95 41 12	3091
	Venus	E.	112 19 24	3414	110 57 23	3415	109 35 24	3418	108 13 28	3420
27	Aldebaran	W.	92 31 31	3095	93 59 47	3095	95 28 3	3095	96 56 19	3095
	Pollux	W.	48 21 51	3092	49 50 10	3091	51 18 30	3091	52 46 51	3090
	Spica	E.	42 33 4	3132	41 5 33	3135	39 38 6	3138	38 10 43	3142
	Antares	E.	88 19 38	3094	86 51 21	3095	85 23 5	3095	83 54 49	3094
	Venus	E.	101 24 17	3427	100 2 31	3427	98 40 45	3426	97 19 0	3425
28	Pollux	W.	60 8 59	3082	61 37 31	3078	63 6 7	3076	64 34 46	3072
	Regulus	W.	24 16 10	3145	25 43 25	3135	27 10 52	3126	28 38 30	3118
	Spica	E.	30 54 59	3165	29 28 8	3173	28 1 26	3180	26 34 53	3189
	Antares	E.	76 33 13	3087	75 4 48	3086	73 36 21	3083	72 7 51	3081
	Venus	E.	90 30 8	3423	89 8 18	3421	87 46 25	3419	86 24 30	3417
29	Pollux	W.	71 59 12	3051	73 28 22	3046	74 57 38	3040	76 27 1	3034
	Regulus	W.	35 59 5	3079	37 27 40	3072	38 56 24	3065	40 25 17	3056
	Antares	E.	64 44 24	3062	63 15 28	3058	61 46 27	3052	60 17 19	3047
	Venus	E.	79 34 6	3399	.78 11 48	3394	76 49 25	3388	75 26 55	3383
	Sun	E.	125 37 5	3446	124 15 41	3440	122 54 10	3434	121 32 32	3428
30	Pollux	W.	83 55 59	2998	85 26 14	2989	86 56 40	2981	88 27 17	2972
	Regulus	W.	47 52 15	3014	49 22 11	3004	50 52 19	2994	52 22 39	2985
	Saturn	W.	29 57 57	2992	31 28 20	2982	32 58 55	2972	34 29 43	2961
	Antares	E.	52 49 55	3016	51 20 2	3009	49 50 0	3001	48 19 49	2993
	Venus	E.	68 32 43	3350	67 9 29	3341	65 46 5	3332	64 22 31	3324
	Sun	E.	114 42 17	3386	113 19 45	3378	111 57 3	3368	110 34 10	3358
31	Pollux	W.	96 3 25	2920	97 35 19	2908	99 7 28	2896	100 39 52	2883
	Regulus	W.	59 57 35	2929	61 29 17	2916	63 1 15	2905	64 33 28	2891
	Saturn	W.	42 7 14	2903	43 39 29	2891	45 11 59	2879	46 44 45	2866
	Antares	E.	40 46 19	2950	39 15 4	2942	37 43 38	2933	36 12 1	2924
	Venus	E.	57 22 1	3275	55 57 20	3263	54 32 25	3252	53 7 17	3239
	Sun	E.	103 36 37	3300	102 12 25	3287	100 47 58	3274	99 23 16	3260

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	20 59 27.63	10.189	S. 17 5 34.8	+42.73	16 16.08	68.27	13 48.17	0.331
Mon.	2	21 3 31.75	10.156	16 48 20.4	43.47	16 15.92	68.16	13 55.72	0.298
Tues.	3	21 7 35.07	10.122	16 30 48.3	44.20	16 15.76	68.04	14 2.46	0.264
Wed.	4	21 11 37.59	10.088	16 12 58.9	+44.91	16 15.60	67.93	14 8 40	0.231
Thur.	5	21 15 39.31	10.055	15 54 52.6	45 60	16 15.43	67.81	14 13.54	0.198
Frid.	6	21 19 40.23	10.021	15 36 29.9	46.28	16 15.26	67.70	14 17.89	0.164
Sat.	7	21 23 40.34	9.988	15 17 51.2	+46.94	16 15.08	67.58	14 21 44	0.131
SUN.	8	21 27 39.65	9.955	14 58 56.9	47.58	16 14.91	67.47	14 24.19	0.098
Mon.	9	21 31 38.18	9.922	14 39 47.4	48.20	16 14.73	67.36	14 26.16	0.065
Tues.	10	21 35 35.92	9.889	14 20 23.2	+48.80	16 14.55	67.25	14 27.34	0.032
Wed.	11	21 39 32.86	9.857	14 0 44.7	49.39	16 14.37	67.14	14 27.73	0.000
Thur.	12	21 43 29.01	9.824	13 40 52.3	49.96	16 14.19	67.03	14 27.33	0.033
Frid.	13	21 47 24.39	9.792	13 20 46.6	+50.51	16 14.00	66.92	14 26.16	0.065
Sat.	14	21 51 19.00	9.759	13 0 27.9	51.03	16 13.81	66.81	14 24.22	0.097
SUN.	15	21 55 12.85	9.727	12 39 56.6	51.55	16 13.61	66.71	14 21.53	0.129
Mon.	16	21 59 5.96	9.696	12 19 13.2	+52.05	16 13.41	66.60	14 18.09	0.160
Tues.	17	22 2 58.34	9.666	11 58 18.2	52.53	16 13.21	66.50	14 13.92	0.190
Wed.	18	22 6 49.99	9.637	11 37 11.9	52.99	16 13.01	66.40	14 9.03	0.220
Thur.	19	22 10 40.94	9.608	11 15 54.8	+53.43	16 12.80	66.30	14 3.44	0.249
Frid.	20	22 14 31.20	9.580	10 54 27.2	53.86	16 12.59	66.20	13 57.16	0.276
Sat.	21	22 18 20.78	9.553	10 32 49.5	54.27	16 12.37	66.11	13 50.21	0.303
SUN.	22	22 22 9.71	9.526	10 11 2.2	+54.66	16 12.15	66.02	13 42.61	0.330
Mon.	23	22 25 58.00	9.500	9 49 5.7	55.04	16 11.92	65.93	13 34 37	0.356
Tues.	24	22 29 45.68	9.475	9 27 0.3	55.40	16 11.69	65.84	13 25.52	0.381
Wed.	25	22 33 32.77	9.450	9 4 46.4	+55.75	16 11.46	65.76	13 16.08	0.406
Thur.	26	22 37 19.29	9.427	8 42 24.4	56.08	16 11.22	65.68	13 6.07	0.429
Frid.	27	22 41 5.26	9.404	8 19 54.7	56.40	16 10.98	65.60	12 55.52	0.452
Sat.	28	22 44 50.69	9.383	7 57 17.6	56.70	16 10.73	65.52	12 44.43	0.473
SUN.	29	22 48 35.61	9.362	S. 7 34 33.5	+56.98	16 10.48	65.44	12 32.82	0.494

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	20 59 25.29	10.188	S. 17 5 44.6	+42.72	13 48.10	0.331	20 45 37.19
Mon.	2	21 3 29.40	10.155	16 48 30.5	43.46	13 55.65	0.298	20 49 33.75
Tues.	3	21 7 32.71	10.121	16 30 58.6	44.19	14 2.40	0.264	20 53 30.31
Wed.	4	21 11 35.22	10.088	16 13 9.4	+44.90	14 8.35	0.231	20 57 26.87
Thur.	5	21 15 36.93	10.055	15 55 3.4	45.59	14 13.50	0.198	21 1 23.43
Frid.	6	21 19 37.85	10.021	15 36 40.9	46.27	14 17.86	0.164	21 5 19.99
Sat.	7	21 23 37.96	9.988	15 18 2.4	+46.93	14 21.42	0.131	21 9 16.54
SUN.	8	21 27 37.27	9.955	14 59 8.3	47.57	14 24.18	0.098	21 13 13.09
Mon.	9	21 31 35.80	9.922	14 39 59.0	48.19	14 26.15	0.065	21 17 9.65
Tues.	10	21 35 33.54	9.889	14 20 35.0	+48.79	14 27.34	0.032	21 21 6.20
Wed.	11	21 39 30.49	9.857	14 0 56.6	49.38	14 27.73	0.000	21 25 2.76
Thur.	12	21 43 26.65	9.824	13 41 4.4	49.95	14 27.34	0.033	21 28 59.31
Frid.	13	21 47 22.04	9.792	13 20 58.8	+50.50	14 26.17	0.065	21 32 55.87
Sat.	14	21 51 16.66	9.760	13 0 40.2	51.03	14 24.24	0.097	21 36 52.42
SUN.	15	21 55 10.53	9.728	12 40 9.0	51.55	14 21.56	0.129	21 40 48.97
Mon.	16	21 59 3.66	9.697	12 19 25.7	+52.05	14 18.13	0.160	21 44 45.53
Tues.	17	22 2 56.05	9.667	11 58 30.7	52.53	14 13.97	0.190	21 48 42.08
Wed.	18	22 6 47.72	9.638	11 37 24.4	52.99	14 9.09	0.220	21 52 38.63
Thur.	19	22 10 38.69	9.609	11 16 7.3	+53.43	14 3.50	0.249	21 56 35.19
Frid.	20	22 14 28.97	9.581	10 54 39.7	53.86	13 57.22	0.276	22 0 31.75
Sat.	21	22 18 18 57	9.554	10 33 2.0	54.27	13 50.27	0.303	22 4 28.30
SUN.	22	22 22 7.53	9.527	10 11 14.7	+54.66	13 42.67	0.330	22 8 24.85
Mon.	23	22 25 55.85	9.501	9 49 18.2	55.04	13 34.44	0.356	22 12 21.41
Tues.	24	22 29 43.56	9.476	9 27 12.7	55.40	13 25.60	0.381	22 16 17.96
Wed.	25	22 33 30.68	9.451	9 4 58.7	+55.75	13 16.16	0.406	22 20 14.52
Thur.	26	22 37 17.23	9.428	8 42 36.6	56.08	13 6.16	0.429	22 24 11.07
Frid.	27	22 41 3.23	9.405	8 20 6.8	56.40	12 55.61	0.452	22 28 7.62
Sat.	28	22 44 48.69	9.384	7 57 29.6	56.70	12 44,52	0.473	22 32 4.17
SUN.	29	22 48 33.65	[illegible]	S. 7 34 45.4	+56.98	12 32.92	0.494	22 36 0.73

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	312 23 39.5	23 50.2	152.19	+ 0.32	9.9936897	+28.6	3 13 50.95
2	33	313 24 31.6	24 42.1	152.15	0.20	9.9937594	29.4	3 9 55.04
3	34	314 25 22.8	25 33.2	152.11	+ 0.07	9.9938308	30.1	3 5 59.13
4	35	315 26 13.1	26 23.4	152.07	− 0.06	9.9939038	+30.8	3 2 3.22
5	36	316 27 2.4	27 12.5	152.03	0.19	9.9939783	31.4	2 58 7.31
6	37	317 27 50.7	28 0.6	151.99	0.31	9.9940543	31.9	2 54 11.41
7	38	318 28 37.9	28 47.7	151.94	− 0.41	9.9941316	+32.4	2 50 15.50
8	39	319 29 23.9	29 33.6	151.89	0.48	9.9942100	32.9	2 46 19.59
9	40	320 30 8.6	30 18.2	151.83	0.52	9.9942894	33.3	2 42 23.67
10	41	321 30 51.9	31 1.3	151.77	− 0.54	9.9943700	+33.8	2 38 27.76
11	42	322 31 33.7	31 43.0	151.71	0.53	9.9944518	34.3	2 34 31.85
12	43	323 32 14.0	32 23.1	151.64	0.48	9.9945348	34.8	2 30 35.94
13	44	324 32 52.6	33 1.6	151.57	− 0.40	9.9946189	+35.3	2 26 40.04
14	45	325 33 29.5	33 38.4	151.50	0.31	9.9947043	35.8	2 22 44.13
15	46	326 34 4.7	34 13.4	151.43	0.20	9.9947910	36.4	2 18 48.22
16	47	327 34 38.0	34 46.6	151.35	− 0.07	9.9948791	+37.0	2 14 52.31
17	48	328 35 9.5	35 18.0	151.27	+ 0.07	9.9949688	37.7	2 10 56.41
18	49	329 35 39.2	35 47.6	151.19	0.20	9.9950602	38.4	2 7 0.50
19	50	330 36 7.0	36 15.3	151.12	+ 0.32	9.9951533	+39.1	2 3 4.59
20	51	331 36 33.0	36 41.1	151.04	0.43	9.9952482	39.9	1 59 8.68
21	52	332 36 57.2	37 5.2	150.97	0.52	9.9953450	40.7	1 55 12.77
22	53	333 37 19.6	37 27.5	150.89	+ 0.59	9.9954437	+41.5	1 51 16.86
23	54	334 37 40.2	37 48.0	150.82	0.62	9.9955443	42 3	1 47 20.95
24	55	335 37 59.0	38 6.7	150.75	0.62	9.9956469	43.1	1 43 25.04
25	56	336 38 16.2	38 23.7	150.68	+ 0.60	9.9957513	+43.9	1 39 29.14
26	57	337 38 31.8	38 39.2	150.61	0.55	9.9958575	44.6	1 35 33.24
27	58	338 38 45.9	38 53.2	150.55	0.47	9.9959654	45.3	1 31 37.33
28	59	339 38 58.4	39 5.6	150.49	0.37	9.9960749	45.9	1 27 41.42
29	60	340 39 9.4	39 16.5	150.43	+ 0.26	9.9961859	+46.5	1 23 45.51

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 9.4	15 15.3	55 31.0	+1.69	55 52.4	+1.87	17 59.7	1.92	21.9
2	15 21.7	15 28.6	56 15.9	2.04	56 41.3	2.19	18 47.5	2.09	22.9
3	15 35.9	15 43.6	57 8.3	2.30	57 36.5	2.39	19 39.8	2.28	23.9
4	15 51.6	15 59.6	58 5.7	+2.44	58 35.1	+2.44	20 37.1	2.47	24.9
5	16 7.5	16 15.2	59 4.3	2.39	59 32.5	2.29	21 38.4	2.60	25.9
6	16 22.4	16 28 9	59 59.0	2.11	60 23.1	1.88	22 42.1	2.64	26.9
7	16 34.7	16 39.4	60 44.1	+1.59	61 1.2	+1.24	23 45.3	2.57	27.9
8	16 42.8	16 45.0	61 13.9	0.86	61 21.8	+0.45	δ		28.9
9	16 45.7	16 45.1	61 24.6	+0.02	61 22.2	−0.40	0 45.6	2.45	0.4
10	16 43.1	16 39 8	61 14.9	−0.81	61 2.8	−1.18	1 42.8	2.31	1.4
11	16 35.4	16 30.0	60 46.6	1.51	60 26.7	1.78	2 36.4	2.18	2.4
12	16 23.7	16 16.9	60 3.9	1.99	59 38.9	2.15	3 27.5	2.10	3.4
13	16 9.7	16 2.3	59 12.4	−2.25	58 45.0	−2.30	4 17.1	2.06	4.4
14	15 54.7	15 47.3	58 17.3	2.29	57 50.0	2.25	5 6.5	2.07	5.4
15	15 39.8	15 33.1	57 23.4	2.17	56 58.0	2.06	5 56.4	2.09	6.4
16	15 26.6	15 20.4	56 33.9	−1.94	56 11.4	−1.81	6 47.2	2.14	7.4
17	15 14.8	15 9.6	55 50.6	1.66	55 31.7	1.50	7 39.0	2.16	8.4
18	15 5.0	15 0.8	55 14.6	1.35	54 59.4	1.19	8 31.1	2.16	9.4
19	14 57.2	14 54.0	54 46.0	−1.04	54 34.4	−0.90	9 22.8	2.12	10.4
20	14 51.3	14 49.1	54 24.4	0.76	54 16.1	0.63	10 12.9	2.05	11.4
21	14 47.2	14 45.7	54 9.3	0.51	54 3.9	0.39	11 1.0	1.95	12.4
22	14 44.7	14 44.0	54 0.0	−0.27	53 57.4	−0.16	11 46.6	1.85	13.4
23	14 43.6	14 43 6	53 56.2	−0.05	53 56.2	+0.05	12 30.0	1.77	14.4
24	14 44.0	14 44.7	53 57.5	+0.16	54 0.1	0.28	13 11.6	1.71	15.4
25	14 45.8	14 47.2	54 4.1	+0.39	54 9.4	+0.50	13 52.1	1.68	16.4
26	14 49.1	14 51.3	54 16.2	0.63	54 24.5	0.75	14 32.5	1.69	17.4
27	14 54.0	14 57.2	54 34.3	0.89	54 45.9	1.03	15 13.5	1.74	18.4
28	15 0.8	15 4.9	54 59.1	1.18	55 14.2	1.33	15 56.3	1.84	19.4
29	15 9.5	15 14.6	55 31.1	+1.48	55 49.8	+1.63	16 41.9	1.97	20.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.					**TUESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 12 52.19	1.9245	S. 10 1 36.5	12.348	0	15 51 34.14	2.2127	S. 19 1 31.5	9.701
1	14 14 47.79	1.9289	10 13 56.5	12.318	1	15 53 47.12	2.2201	19 11 11.0	9.614
2	14 16 43.66	1.9334	10 26 14.7	12.288	2	15 56 0.55	2.2276	19 20 45.2	9.526
3	14 18 39.80	1.9379	10 38 31.1	12.257	3	15 58 14.43	2.2351	19 30 14.1	9.437
4	14 20 36.21	1.9425	10 50 45.6	12.224	4	16 0 28.76	2.2426	19 39 37.6	9.347
5	14 22 32.90	1.9472	11 2 58.0	12.190	5	16 2 43.54	2.2501	19 48 55.7	9.255
6	14 24 29.87	1.9519	11 15 8.4	12.156	6	16 4 58.77	2.2577	19 58 8.2	9.161
7	14 26 27.13	1.9567	11 27 16.7	12.120	7	16 7 14.46	2.2653	20 7 15.0	9.066
8	14 28 24.68	1.9617	11 39 22.8	12.084	8	16 9 30.61	2.2729	20 16 16.1	8.970
9	14 30 22.53	1.9667	11 51 26.8	12.047	9	16 11 47.21	2.2805	20 25 11.4	8.872
10	14 32 20.68	1.9718	12 3 28.5	12.008	10	16 14 4.27	2.2882	20 34 0.8	8.772
11	14 34 19.14	1.9769	12 15 27.8	11.968	11	16 16 21.79	2.2958	20 42 44.1	8.671
12	14 36 17.91	1.9821	12 27 24.7	11.928	12	16 18 39.77	2.3035	20 51 21.3	8.568
13	14 38 16.99	1.9873	12 39 19.1	11.887	13	16 20 58.21	2.3112	20 59 52.3	8.465
14	14 40 16.39	1.9927	12 51 11.1	11.845	14	16 23 17.12	2.3190	21 8 17.1	8.359
15	14 42 16.11	1.9981	13 3 0.5	11.801	15	16 25 36.49	2.3267	21 16 35.4	8.251
16	14 44 16.16	2.0036	13 14 47.2	11.756	16	16 27 56.33	2.3345	21 24 47.2	8.142
17	14 46 16.54	2.0091	13 26 31.2	11.711	17	16 30 16.63	2.3422	21 32 52.5	8.032
18	14 48 17.25	2.0147	13 38 12.5	11.664	18	16 32 37.39	2.3499	21 40 51.1	7.921
19	14 50 18.30	2.0204	13 49 50.9	11.616	19	16 34 58.62	2.3577	21 48 43.0	7.807
20	14 52 19.70	2.0262	14 1 26.4	11.567	20	16 37 20.31	2.3654	21 56 28.0	7.692
21	14 54 21.45	2.0321	14 12 59.0	11.517	21	16 39 42.47	2.3731	22 4 6.0	7.575
22	14 56 23.55	2.0379	14 24 28.5	11.466	22	16 42 5.09	2.3808	22 11 37.0	7.457
23	14 58 26.00	2.0436	S. 14 35 54.9	11.413	23	16 44 28.17	2.3886	S. 22 19 0.9	7.337
	MONDAY 2.					**WEDNESDAY 4.**			
0	15 0 28.81	2.0499	S. 14 47 18.1	11.359	0	16 46 51.72	2.3963	S. 22 26 17.5	7.216
1	15 2 31.99	2.0561	14 58 38.0	11.305	1	16 49 15.73	2.4040	22 33 26.8	7.093
2	15 4 35.54	2.0622	15 9 54.7	11.250	2	16 51 40.20	2.4116	22 40 28.7	6.969
3	15 6 39.46	2.0684	15 21 8.0	11.192	3	16 54 5.12	2.4192	22 47 23.1	6.843
4	15 8 43.75	2.0747	15 32 17.8	11.134	4	16 56 30.50	2.4268	22 54 9.9	6.715
5	15 10 48.43	2.0812	15 43 24.1	11.075	5	16 58 56.34	2.4344	23 0 48.9	6.585
6	15 12 53.49	2.0876	15 54 26.8	11.014	6	17 1 22.63	2.4419	23 7 20.1	6.454
7	15 14 58.94	2.0941	16 5 25.8	10.952	7	17 3 49.37	2.4494	23 13 43.4	6.322
8	15 17 4.78	2.1006	16 16 21.1	10.889	8	17 6 16.56	2.4569	23 19 58.7	6.188
9	15 19 11.01	2.1072	16 27 12.5	10.824	9	17 8 44.20	2.4643	23 26 6.0	6.053
10	15 21 17.64	2.1138	16 38 0.0	10.758	10	17 11 12.28	2.4716	23 32 5.1	5.916
11	15 23 24 67	2.1206	16 48 43.5	10.692	11	17 13 40.80	2.4789	23 37 55.9	5.777
12	15 25 32.11	2.1274	16 59 23.0	10.624	12	17 16 9.75	2.4862	23 43 38.3	5.636
13	15 27 39.96	2.1342	17 9 58.4	10.555	13	17 18 39.14	2.4934	23 49 12.2	5.494
14	15 29 48.22	2.1411	17 20 29.6	10.484	14	17 21 8.96	2.5006	23 54 37.6	5.352
15	15 31 56.89	2.1480	17 30 56.5	10.412	15	17 23 39.21	2.5077	23 59 54.4	5.207
16	15 34 5.98	2.1551	17 41 19.0	10.338	16	17 26 9.88	2.5147	24 5 2.5	5.061
17	15 36 15.50	2.1622	17 51 37.0	10.262	17	17 28 40.97	2.5217	24 10 1.7	4.912
18	15 38 25.44	2.1692	18 1 50.4	10.185	18	17 31 12.48	2.5286	24 14 52.0	4.763
19	15 40 35.80	2.1764	18 11 59.2	10.108	19	17 33 44.40	2.5353	24 19 33.3	4.613
20	15 42 46.60	2.1836	18 22 3.4	10.030	20	17 36 16.72	2.5420	24 24 5.5	4.461
21	15 44 57.83	2.1908	18 32 2.8	9.949	21	17 38 49.44	2.5487	24 28 28.6	4.307
22	15 47 9.50	2.1981	18 41 57.3	9.867	22	17 41 22.56	2.5552	24 32 42.4	4.152
23	15 49 21.60	2.2054	18 51 46.9	9.785	23	17 43 56.07	2.5617	24 36 46.8	3.995
24	15 51 34.14	2.2127	S. 19 1 31.5	9.701	24	17 46 29.96	2.5680	S. 24 40 41.8	3.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 46 29.96	2.5680	S.24 40 41.8	3.837
1	17 49 4.23	2.5743	24 44 27.3	3.678
2	17 51 38.88	2.5805	24 48 3.2	3.518
3	17 54 13.89	2.5865	24 51 29.4	3.356
4	17 56 49.26	2.5925	24 54 45.9	3.192
5	17 59 24.99	2.5983	24 57 52.5	3.027
6	18 2 1.06	2.6040	25 0 49.2	2.862
7	18 4 37.47	2.6097	25 3 35.9	2.695
8	18 7 14.22	2.6152	25 6 12.6	2.527
9	18 9 51.29	2.6205	25 8 39.2	2.358
10	18 12 28.68	2.6257	25 10 55.6	2.187
11	18 15 6.38	2.6309	25 13 1.7	2.016
12	18 17 44.39	2.6360	25 14 57.5	1.843
13	18 20 22.70	2.6408	25 16 42.9	1.669
14	18 23 1.29	2.6454	25 18 17.8	1.494
15	18 25 40.15	2.6499	25 19 42.2	1.318
16	18 28 19.28	2.6544	25 20 56.0	1.142
17	18 30 58.68	2.6587	25 21 59.2	0.964
18	18 33 38.33	2.6628	25 22 51.7	0.785
19	18 36 18.22	2.6668	25 23 33.4	0.606
20	18 38 58.35	2.6707	25 24 4.4	0.427
21	18 41 38.70	2.6743	25 24 24.6	0.246
22	18 44 19.27	2.6779	25 24 33.9	− 0.063
23	18 47 0.05	2.6812	S.25 24 32.2	+ 0.120

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 49 41.02	2.6844	S.25 21 19.5	0.303
1	18 52 22.18	2.6875	25 23 55.8	0.487
2	18 55 3.52	2.6904	25 23 21.1	0.671
3	18 57 45.03	2.6932	25 22 35.3	0.856
4	19 0 26.70	2.6957	25 21 38.4	1.042
5	19 3 8.51	2.6980	25 20 30.3	1.227
6	19 5 50.46	2.7002	25 19 11.1	1.413
7	19 8 32.54	2.7023	25 17 40.7	1.600
8	19 11 14.74	2.7042	25 15 59.1	1.787
9	19 13 57.05	2.7060	25 14 6.2	1.975
10	19 16 39.46	2.7075	25 12 2.1	2.162
11	19 19 21.95	2.7088	25 9 46.7	2.350
12	19 22 4.52	2.7101	25 7 20.1	2.538
13	19 24 47.16	2.7112	25 4 42.2	2.726
14	19 27 29.86	2.7120	25 1 53.0	2.914
15	19 30 12.60	2.7127	24 58 52.5	3.102
16	19 32 55.38	2.7132	24 55 40.7	3.290
17	19 35 38.18	2.7135	24 52 17.7	3.478
18	19 38 21.00	2.7137	24 48 43.4	3.666
19	19 41 3.82	2.7137	24 44 57.8	3.853
20	19 43 46.64	2.7136	24 41 1.0	4.040
21	19 46 29.45	2.7132	24 36 53.0	4.228
22	19 49 12.23	2.7127	24 32 33.7	4.415
23	19 51 54.98	2.7121	24 28 3.2	4.601
24	19 54 37.68	2.7112	S.24 23 21.6	4.788

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 54 37.68	2.7112	S.24 23 21.6	4.788
1	19 57 20.33	2.7102	24 18 28.8	4.973
2	20 0 2.91	2.7091	24 13 24.9	5.158
3	20 2 45.42	2.7077	24 8 9.9	5.343
4	20 5 27.84	2.7062	24 2 43.8	5.526
5	20 8 10.17	2.7047	23 57 6.8	5.708
6	20 10 52.40	2.7029	23 51 18.8	5.891
7	20 13 34.52	2.7009	23 45 19.9	6.073
8	20 16 16.51	2.6987	23 39 10.0	6.255
9	20 18 58.37	2.6965	23 32 49.3	6.434
10	20 21 40.09	2.6942	23 26 17.9	6.613
11	20 24 21.67	2.6917	23 19 35.7	6.792
12	20 27 3.09	2.6889	23 12 42.8	6.970
13	20 29 44.34	2.6861	23 5 39.3	7.146
14	20 32 25.42	2.6832	22 58 25.3	7.321
15	20 35 6.32	2.6801	22 51 0.8	7.495
16	20 37 47.03	2.6768	22 43 25.9	7.668
17	20 40 27.54	2.6735	22 35 40.6	7.840
18	20 43 7.85	2.6701	22 27 45.1	8.010
19	20 45 47.95	2.6665	22 19 39.4	8.180
20	20 48 27.83	2.6627	22 11 23.5	8.349
21	20 51 7.48	2.6589	22 2 57.5	8.516
22	20 53 46.90	2.6550	21 54 21.6	8.681
23	20 56 26.08	2.6509	S.21 45 35.8	8.844

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 59 5.01	2.6467	S.21 36 40.3	9.006
1	21 1 43.69	2.6425	21 27 35.1	9.167
2	21 4 22.11	2.6382	21 18 20.2	9.328
3	21 7 0.27	2.6337	21 8 55.7	9.487
4	21 9 38.16	2.6292	20 59 21.8	9.643
5	21 12 15.78	2.6246	20 49 38.6	9.797
6	21 14 53.11	2.6199	20 39 46.2	9.950
7	21 17 30.16	2.6151	20 29 44.6	10.102
8	21 20 6.92	2.6102	20 19 34.0	10.252
9	21 22 43.38	2.6052	20 9 14.4	10.400
10	21 25 19.54	2.6002	19 58 46.0	10.546
11	21 27 55.40	2.5952	19 48 8.9	10.691
12	21 30 30.96	2.5900	19 37 23.1	10.834
13	21 33 6.20	2.5848	19 26 28.8	10.975
14	21 35 41.13	2.5795	19 15 26.1	11.114
15	21 38 15.74	2.5741	19 4 15.1	11.252
16	21 40 50.02	2.5687	18 52 55.9	11.387
17	21 43 23.98	2.5632	18 41 28.7	11.520
18	21 45 57.61	2.5577	18 29 53.5	11.652
19	21 48 30.91	2.5522	18 18 10.5	11.782
20	21 51 3.88	2.5467	18 6 19.7	11.910
21	21 53 36.51	2.5411	17 54 21.3	12.036
22	21 56 8.81	2.5355	17 42 15.4	12.159
23	21 58 40.77	2.5298	17 30 2.2	12.281
24	22 1 12.39	2.5242	S.17 17 41.7	12.401

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 1 12.39	2.5242	S. 17 17 41.7	12.401
1	22 3 43.67	2.5185	17 5 14.1	12.518
2	22 6 14.61	2.5127	16 52 39.5	12.634
3	22 8 45.20	2.5070	16 39 58.0	12.747
4	22 11 15.45	2.5012	16 27 9.8	12.859
5	22 13 45.35	2.4954	16 14 14.9	12.969
6	22 16 14.90	2.4897	16 1 13.5	13.077
7	22 18 44.11	2.4839	15 48 5.7	13.182
8	22 21 12.97	2.4781	15 34 51.7	13.284
9	22 23 41.48	2.4723	15 21 31.6	13.385
10	22 26 9.65	2.4666	15 8 5.5	13.484
11	22 28 37.47	2.4608	14 54 33.5	13.582
12	22 31 4.95	2.4551	14 40 55.7	13.677
13	22 33 32.08	2.4493	14 27 12.3	13.769
14	22 35 58.87	2.4436	14 13 23.4	13.859
15	22 38 25.31	2.4379	13 59 29.2	13.947
16	22 40 51.41	2.4322	13 45 29.7	14.033
17	22 43 17.17	2.4265	13 31 25.2	14.117
18	22 45 42.59	2.4208	13 17 15.7	14.199
19	22 48 7.67	2.4152	13 3 1.3	14.279
20	22 50 32.42	2.4096	12 48 42.2	14.357
21	22 52 56.83	2.4040	12 34 18.5	14.432
22	22 55 20.90	2.3986	12 19 50.3	14.506
23	22 57 44.65	2.3931	S. 12 5 17.8	14.577

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 0 8.07	2.3876	S. 11 50 41.0	14.647
1	23 2 31.16	2.3822	11 36 0.2	14.714
2	23 4 53.93	2.3768	11 21 15.4	14.779
3	23 7 16.37	2.3714	11 6 26.7	14.849
4	23 9 38.50	2.3661	10 51 34.3	14.902
5	23 12 0.31	2.3608	10 36 38.4	14.961
6	23 14 21.80	2.3556	10 21 39.0	15.018
7	23 16 42.98	2.3504	10 6 36.3	15.073
8	23 19 3.85	2.3453	9 51 30.3	15.126
9	23 21 24.42	2.3402	9 36 21.2	15.176
10	23 23 44.68	2.3352	9 21 9.2	15.223
11	23 26 4.65	2.3303	9 5 54.4	15.270
12	23 28 24.32	2.3254	8 50 36.8	15.315
13	23 30 43.70	2.3206	8 35 16.6	15.357
14	23 33 2.79	2.3158	8 19 54.0	15.397
15	23 35 21.59	2.3110	8 4 29.0	15.435
16	23 37 40.11	2.3063	7 49 1.8	15.472
17	23 39 58.35	2.3017	7 33 32.4	15.506
18	23 42 16.31	2.2971	7 18 1.0	15.538
19	23 44 34.00	2.2926	7 2 27.8	15.568
20	23 46 51.43	2.2882	6 46 52 8	15.597
21	23 49 8.59	2.2838	6 31 16 1	15.624
22	23 51 25.49	2.2796	6 15 37 9	15.648
23	23 53 42.14	2.2753	5 59 58 3	15.671
24	23 55 58.53	2.2711	S. 5 44 17.4	15.692

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 55 58.53	2.2711	S. 5 44 17.4	15.692
1	23 58 14.67	2.2670	5 28 35.3	15.711
2	0 0 30.57	2.2631	5 12 52.1	15.727
3	0 2 46.24	2.2592	4 57 8.0	15.742
4	0 5 1.67	2.2552	4 41 23.0	15.756
5	0 7 16.86	2.2513	4 25 37.3	15.767
6	0 9 31.82	2.2475	4 9 50.9	15.777
7	0 11 46.56	2.2438	3 54 4.0	15.785
8	0 14 1.08	2.2402	3 38 16.7	15.791
9	0 16 15.39	2.2367	3 22 29.1	15.795
10	0 18 29.49	2.2332	3 6 41.3	15.797
11	0 20 43.38	2.2298	2 50 53.4	15.799
12	0 22 57.07	2.2265	2 35 5.4	15.798
13	0 25 10.56	2.2232	2 19 17.6	15.795
14	0 27 23.86	2.2201	2 3 30.0	15.791
15	0 29 36.97	2.2170	1 47 42.7	15.785
16	0 31 49.90	2.2140	1 31 55.8	15.777
17	0 34 2.65	2.2110	1 16 9.5	15.767
18	0 36 15.22	2.2081	1 0 23.8	15.756
19	0 38 27.62	2.2052	0 44 38.8	15.743
20	0 40 39.85	2.2025	0 28 54.6	15.729
21	0 42 51.92	2.1998	S. 0 13 11.3	15.713
22	0 45 3.83	2.1972	N. 0 2 31.0	15.696
23	0 47 15.59	2.1947	N. 0 18 12.2	15.677

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 49 27.20	2.1922	N. 0 33 52.2	15.656
1	0 51 38.66	2.1899	0 49 30.9	15.634
2	0 53 49.99	2.1877	1 5 8.3	15.611
3	0 56 1.18	2.1854	1 20 44.2	15.585
4	0 58 12.24	2.1832	1 36 18.5	15.558
5	1 0 23.17	2.1812	1 51 51.2	15.530
6	1 2 33.98	2.1792	2 7 22.1	15.500
7	1 4 44.67	2.1772	2 22 51.2	15.470
8	1 6 55.24	2.1753	2 38 18.5	15.437
9	1 9 5.70	2.1735	2 53 43.7	15.402
10	1 11 16.06	2.1718	3 9 6.8	15.367
11	1 13 26.32	2.1702	3 24 27.8	15.331
12	1 15 36.48	2.1686	3 39 46.5	15.293
13	1 17 46.55	2.1671	3 55 2.9	15.253
14	1 19 56.53	2.1657	4 10 16.9	15.212
15	1 22 6.43	2.1643	4 25 28.4	15.170
16	1 24 16.24	2.1629	4 40 37.3	15.126
17	1 26 25.98	2.1617	4 55 43.5	15.080
18	1 28 35.65	2.1606	5 10 46.9	15.034
19	1 30 45.25	2.1595	5 25 47.5	14.987
20	1 32 54.79	2.1585	5 40 45.3	14.938
21	1 35 4.27	2.1576	5 55 40.1	14.888
22	1 37 13.70	2.1567	6 10 31.9	14.837
23	1 39 23.07	2.1558	6 25 20.5	14.783
24	1 41 32.39	2.1550	N. 6 40 5.9	14.729

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 41 32.39	2.1550	N. 6 40 5.9	14.729
1	1 43 41.67	2.1543	6 54 48.0	14.674
2	1 45 50.91	2.1537	7 9 26.8	14.618
3	1 48 0.12	2.1532	7 24 2.2	14.561
4	1 50 9.29	2.1527	7 38 34.1	14.502
5	1 52 18.44	2.1522	7 53 2.5	14.442
6	1 54 27.56	2.1519	8 7 27.2	14.381
7	1 56 36.66	2.1516	8 21 48.2	14.319
8	1 58 45.75	2.1513	8 36 5.5	14.256
9	2 0 54.82	2.1511	8 50 18.9	14.191
10	2 3 3.88	2.1510	9 4 28.4	14.126
11	2 5 12.94	2.1509	9 18 34.0	14.059
12	2 7 21.99	2.1508	9 32 35.5	13.991
13	2 9 31.04	2.1509	9 46 32.9	13.922
14	2 11 40.10	2.1511	10 0 26.2	13.852
15	2 13 49.17	2.1512	10 14 15.2	13.781
16	2 15 58.25	2.1514	10 27 59.9	13.709
17	2 18 7.34	2.1517	10 41 40.3	13.636
18	2 20 16.45	2.1520	10 55 16.2	13.561
19	2 22 25.58	2.1523	11 8 47.6	13.486
20	2 24 34.73	2.1527	11 22 14.5	13.411
21	2 26 43.91	2.1532	11 35 36.9	13.334
22	2 28 53.12	2.1537	11 48 54.6	13.255
23	2 31 2.36	2.1543	N.12 2 7.5	13.175

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 33 11.64	2.1550	N.12 15 15.6	13.095
1	2 35 20.96	2.1557	12 28 18.9	13.014
2	2 37 30.32	2.1564	12 41 17.3	12.932
3	2 39 39.72	2.1571	12 54 10.7	12.849
4	2 41 49.17	2.1579	13 6 59.1	12.765
5	2 43 58.67	2.1588	13 19 42.5	12.681
6	2 46 8.22	2.1597	13 32 20.8	12.595
7	2 48 17.83	2.1606	13 44 53.9	12.508
8	2 50 27.49	2.1615	13 57 21.7	12.420
9	2 52 37.21	2.1626	14 9 44.3	12.332
10	2 54 47.00	2.1637	14 22 1.5	12.242
11	2 56 56.85	2.1647	14 34 13.3	12.152
12	2 59 6.76	2.1658	14 46 19.7	12.061
13	3 1 16.74	2.1669	14 58 20.6	11.968
14	3 3 26.79	2.1682	15 10 15.9	11.875
15	3 5 36.92	2.1694	15 22 5.6	11.782
16	3 7 47.12	2.1707	15 33 49.7	11.688
17	3 9 57.40	2.1719	15 45 28.1	11.593
18	3 12 7.75	2.1732	15 57 0.8	11.497
19	3 14 18.18	2.1746	16 8 27.7	11.399
20	3 16 28.70	2.1760	16 19 48.7	11.301
21	3 18 39.30	2.1773	16 31 3.8	11.202
22	3 20 49.98	2.1787	16 42 13.0	11.103
23	3 23 0.75	2.1802	16 53 16.2	11.003
24	3 25 11.61	2.1817	N.17 4 13.4	10.902

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 25 11.61	2.1817	N.17 4 13.4	10.902
1	3 27 22.55	2.1831	17 15 4.5	10.801
2	3 29 33.58	2.1847	17 25 49.5	10.698
3	3 31 44.71	2.1862	17 36 28.3	10.595
4	3 33 55.93	2.1877	17 47 0.9	10.491
5	3 36 7.24	2.1892	17 57 27.2	10.387
6	3 38 18.64	2.1908	18 7 47.3	10.282
7	3 40 30.14	2.1924	18 18 1.0	10.175
8	3 42 41.73	2.1940	18 28 8.3	10.069
9	3 44 53.42	2.1957	18 38 9.3	9.962
10	3 47 5.21	2.1973	18 48 3.8	9.854
11	3 49 17.10	2.1989	18 57 51.8	9.745
12	3 51 29.08	2.2005	19 7 33.2	9.635
13	3 53 41.16	2.2022	19 17 8.0	9.525
14	3 55 53.34	2.2038	19 26 36.2	9.415
15	3 58 5.62	2.2055	19 35 57.8	9.304
16	4 0 18.00	2.2071	19 45 12.7	9.192
17	4 2 30.47	2.2087	19 54 20.8	9.079
18	4 4 43.04	2.2103	20 3 22.2	8.966
19	4 6 55.71	2.2120	20 12 16.8	8.852
20	4 9 8.48	2.2137	20 21 4.5	8.737
21	4 11 21.35	2.2153	20 29 45.3	8.622
22	4 13 34.32	2.2169	20 38 19.2	8.507
23	4 15 47.38	2.2185	N.20 46 46.1	8.391

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 18 0.54	2.2201	N.20 55 6.1	8.275
1	4 20 13.79	2.2217	21 3 19.1	8.157
2	4 22 27.14	2.2233	21 11 25.0	8.039
3	4 24 40.59	2.2249	21 19 23.8	7.921
4	4 26 54.13	2.2264	21 27 15.6	7.803
5	4 29 7.76	2.2280	21 35 0.2	7.683
6	4 31 21.49	2.2296	21 42 37.6	7.563
7	4 33 35.31	2.2310	21 50 7.8	7.443
8	4 35 49.21	2.2324	21 57 30.8	7.322
9	4 38 3.20	2.2339	22 4 46.5	7.201
10	4 40 17.28	2.2354	22 11 54.9	7.079
11	4 42 31.45	2.2368	22 18 56.0	6.957
12	4 44 45.70	2.2382	22 25 49.8	6.835
13	4 47 0.03	2.2395	22 32 36.2	6.712
14	4 49 14.44	2.2409	22 39 15.2	6.588
15	4 51 28.94	2.2422	22 45 46.8	6.465
16	4 53 43.51	2.2435	22 52 11.0	6.341
17	4 55 58.16	2.2447	22 58 27.7	6.216
18	4 58 12.88	2.2459	23 4 36.9	6.091
19	5 0 27.67	2.2471	23 10 38.6	5.966
20	5 2 42.53	2.2482	23 16 32.8	5.840
21	5 4 57.46	2.2493	23 22 19.4	5.713
22	5 7 12.45	2.2503	23 27 58.4	5.587
23	5 9 27.50	2.2514	23 33 29.8	5.461
24	5 11 42.62	2.2524	N.23 38 53.7	5.334

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 11 42.62	2.2524	N.23 38 53.7	5.334	0	6 59 59.60	2.2370	N.25 25 44.0	0.880
1	5 13 57.79	2.2533	23 44 9.9	5.206	1	7 2 13.77	2.2352	25 24 47.4	1.007
2	5 16 13.02	2.2542	23 49 18.4	5.078	2	7 4 27.83	2.2334	25 23 43.2	1.133
3	5 18 28.30	2.2551	23 54 19.3	4.951	3	7 6 41.78	2.2315	25 22 31.4	1.259
4	5 20 43.63	2.2559	23 59 12.5	4.823	4	7 8 55.61	2.2295	25 21 12.1	1.385
5	5 22 59.01	2.2567	24 3 58.0	4.695	5	7 11 9.32	2.2274	25 19 45.2	1.511
6	5 25 14.44	2.2575	24 8 35.9	4.567	6	7 13 22.90	2.2253	25 18 10.8	1.635
7	5 27 29.91	2.2582	24 13 6.0	4.438	7	7 15 36.35	2.2232	25 16 29.0	1.759
8	5 29 45.42	2.2588	24 17 28.4	4.308	8	7 17 49.68	2.2211	25 14 39.7	1.884
9	5 32 0.96	2.2593	24 21 43.0	4.179	9	7 20 2.88	2.2188	25 12 42.9	2.008
10	5 34 16.54	2.2598	24 25 49.9	4.050	10	7 22 15.94	2.2164	25 10 38.7	2.131
11	5 36 32.14	2.2603	24 29 49.0	3.920	11	7 24 28.85	2.2140	25 8 27.1	2.254
12	5 38 47.77	2.2608	24 33 40.3	3.790	12	7 26 41.62	2.2116	25 6 8.2	2.377
13	5 41 3.43	2.2611	24 37 23.8	3.660	13	7 28 54.24	2.2091	25 3 41.9	2.499
14	5 43 19.11	2.2614	24 40 59.5	3.530	14	7 31 6.71	2.2066	25 1 8.3	2.620
15	5 45 34.80	2.2617	24 44 27.4	3.400	15	7 33 19.03	2.2040	24 58 27.5	2.741
16	5 47 50.51	2.2619	24 47 47.5	3.270	16	7 35 31.19	2.2014	24 55 39.4	2.862
17	5 50 6.23	2.2621	24 50 59.8	3.140	17	7 37 43.20	2.1988	24 52 44.1	2.982
18	5 52 21.96	2.2622	24 54 4.3	3.009	18	7 39 55.05	2.1961	24 49 41.6	3.102
19	5 54 37.69	2.2622	24 57 0.9	2.878	19	7 42 6.73	2.1933	24 46 31.9	3.221
20	5 56 53.42	2.2622	24 59 49.7	2.748	20	7 44 18.24	2.1904	24 43 15.1	3.339
21	5 59 9.15	2.2622	25 2 30.7	2.617	21	7 46 29.58	2.1875	24 39 51.2	3.457
22	6 1 24.88	2.2620	25 5 3.8	2.487	22	7 48 40.74	2.1846	24 36 20.3	3.574
23	6 3 40.59	2.2617	N.25 7 29.1	2.357	23	7 50 51.73	2.1817	N.24 32 42.3	3.691
	WEDNESDAY 18.					FRIDAY 20			
0	6 5 56.29	2.2615	N.25 9 46.6	2.226	0	7 53 2.54	2.1786	N.24 28 57.3	3.807
1	6 8 11.97	2.2612	25 11 56.2	2.095	1	7 55 13.16	2.1755	24 25 5.4	3.923
2	6 10 27.64	2.2609	25 13 58.0	1.964	2	7 57 23.60	2.1725	24 21 6.5	4.039
3	6 12 43.28	2.2604	25 15 51.9	1.833	3	7 59 33.86	2.1694	24 17 0.7	4.153
4	6 14 58.89	2.2599	25 17 38.0	1.702	4	8 1 43.93	2.1662	24 12 48.1	4.267
5	6 17 14.47	2.2594	25 19 16.2	1.572	5	8 3 53.81	2.1630	24 8 28.6	4.381
6	6 19 30.02	2.2588	25 20 46.6	1.442	6	8 6 3.49	2.1597	24 4 2.3	4.494
7	6 21 45.53	2.2581	25 22 9.2	1.312	7	8 8 12.97	2.1564	23 59 29.3	4.606
8	6 24 0.99	2.2574	25 23 24.0	1.181	8	8 10 22.26	2.1531	23 54 49.6	4.718
9	6 26 16.41	2.2566	25 24 30.9	1.050	9	8 12 31.35	2.1497	23 50 3.2	4.829
10	6 28 31.78	2.2557	25 25 30.0	0.921	10	8 14 40.23	2.1463	23 45 10.1	4.939
11	6 30 47.09	2.2548	25 26 21.4	0.792	11	8 16 48.91	2.1430	23 40 10.5	5.048
12	6 33 2.35	2.2538	25 27 5.0	0.662	12	8 18 57.39	2.1396	23 35 4.3	5.157
13	6 35 17.55	2.2527	25 27 40.8	0.532	13	8 21 5.66	2.1361	23 29 51.6	5.266
14	6 37 32.68	2.2516	25 28 8.8	0.402	14	8 23 13.72	2.1325	23 24 32.4	5.374
15	6 39 47.74	2.2504	25 28 29.0	0.273	15	8 25 21.56	2.1289	23 19 6.7	5.481
16	6 42 2.73	2.2491	25 28 41.5	0.144	16	8 27 29.19	2.1254	23 13 34.7	5.587
17	6 44 17.64	2.2478	25 28 46.3	+ 0.015	17	8 29 36.61	2.1218	23 7 56.3	5.692
18	6 46 32.47	2.2465	25 28 43.3	− 0.114	18	8 31 43.81	2.1182	23 2 11.6	5.797
19	6 48 47.22	2.2452	25 28 32.6	0.243	19	8 33 50.79	2.1146	22 56 20.6	5.902
20	6 51 1.89	2.2437	25 28 14.2	0.371	20	8 35 57.56	2.1110	22 50 23.4	6.005
21	6 53 16.47	2.2422	25 27 48.1	0.498	21	8 38 4.11	2.1073	22 44 20.0	6.108
22	6 55 30.95	2.2405	25 27 14.4	0.626	22	8 40 10.43	2.1035	22 38 10.4	6.211
23	6 57 45.33	2.2387	25 26 33.0	0.753	23	8 42 16.53	2.0998	22 31 54.7	6.312
24	6 59 59.60	2.2370	N.25 25 44.0	0.880	24	8 44 22.41	2.0961	N 22 25 33.0	6.412

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					**MONDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 44 22.41	2.0961	N.22 25 33.0	6.412	0	10 20 38.15	1.9187	N.15 36 23.4	10.334
1	8 46 28.06	2.0923	22 19 5.3	6.519	1	10 22 33.18	1.9155	15 26 1.5	10.396
2	8 48 33.49	2.0886	22 12 31.6	6.612	2	10 24 28.01	1.9122	15 15 35.9	10.457
3	8 50 38.69	2.0848	22 5 51.9	6.711	3	10 26 22.64	1.9089	15 5 6.7	10.517
4	8 52 43.67	2.0811	21 59 6.3	6.808	4	10 28 17.08	1.9058	14 54 33.9	10.577
5	8 54 48.42	2.0773	21 52 14.9	6.904	5	10 30 11.34	1.9027	14 43 57.5	10.637
6	8 56 52.94	2.0734	21 45 17.8	7.000	6	10 32 5.41	1.8997	14 33 17.5	10.695
7	8 58 57.23	2.0696	21 38 14.9	7.096	7	10 33 59.30	1.8966	14 22 34.1	10.752
8	9 1 1.29	2.0658	21 31 6.3	7.191	8	10 35 53.00	1.8935	14 11 47.3	10.808
9	9 3 5.13	2.0621	21 23 52.0	7.285	9	10 37 46.52	1.8906	14 0 57.1	10.865
10	9 5 8.74	2.0582	21 16 32.1	7.378	10	10 39 39.87	1.8877	13 50 3.5	10.921
11	9 7 12.11	2.0543	21 9 6.7	7.470	11	10 41 33.04	1.8847	13 39 6.6	10.975
12	9 9 15.25	2.0504	21 1 35.7	7.562	12	10 43 26.03	1.8818	13 28 6.5	11.028
13	9 11 18.16	2.0466	20 53 59.2	7.653	13	10 45 18.85	1.8790	13 17 3.2	11.081
14	9 13 20.84	2.0427	20 46 17.3	7.743	14	10 47 11.51	1.8762	13 5 56.8	11.133
15	9 15 23.29	2.0389	20 38 30.1	7.832	15	10 49 4.00	1.8735	12 54 47.3	11.184
16	9 17 25.51	2.0351	20 30 37.5	7.920	16	10 50 56.33	1.8708	12 43 34.7	11.235
17	9 19 27.50	2.0312	20 22 39.7	8.008	17	10 52 48.50	1.8681	12 32 19.1	11.285
18	9 21 29.26	2.0274	20 14 36.6	8.095	18	10 54 40.50	1.8654	12 21 0.5	11.334
19	9 23 30.79	2.0236	20 6 28.3	8.181	19	10 56 32.35	1.8629	12 9 39.0	11.382
20	9 25 32.09	2.0197	19 58 14.9	8.266	20	10 58 24.05	1.8603	11 58 14.7	11.429
21	9 27 33.16	2.0159	19 49 56.4	8.351	21	11 0 15.59	1.8578	11 46 47.5	11.476
22	9 29 34.00	2.0121	19 41 32.8	8.435	22	11 2 6.99	1.8554	11 35 17.6	11.522
23	9 31 34.61	2.0082	N.19 33 4.2	8.518	23	11 3 58.24	1.8529	N.11 23 44.9	11.567
	SUNDAY 22.					**TUESDAY 24.**			
0	9 33 34.99	2.0044	N.19 24 30.6	8.601	0	11 5 49.34	1.8505	N.11 12 9.5	11.612
1	9 35 35.14	2.0007	19 15 52.1	8.682	1	11 7 40.30	1.8482	11 0 31.5	11.655
2	9 37 35.07	1.9969	19 7 8.8	8.762	2	11 9 31.13	1.8460	10 48 50.9	11.698
3	9 39 34.77	1.9932	18 58 20.7	8.841	3	11 11 21.82	1.8438	10 37 7.7	11.741
4	9 41 34.25	1.9894	18 49 27.9	8.920	4	11 13 12.38	1.8416	10 25 22.0	11.782
5	9 43 33.50	1.9857	18 40 30.3	8.999	5	11 15 2.81	1.8394	10 13 33.9	11.822
6	9 45 32.53	1.9820	18 31 28.0	9.077	6	11 16 53.11	1.8373	10 1 43.3	11.862
7	9 47 31.34	1.9782	18 22 21.1	9.153	7	11 18 43.28	1.8352	9 49 50.4	11.901
8	9 49 29.92	1.9745	18 13 9.7	9.228	8	11 20 33.34	1.8333	9 37 55.2	11.939
9	9 51 28.28	1.9708	18 3 53.7	9.304	9	11 22 23.28	1.8314	9 25 57.7	11.977
10	9 53 26.42	1.9672	17 54 33.2	9.378	10	11 24 13.11	1.8295	9 13 57.9	12.015
11	9 55 24.35	1.9636	17 45 8.3	9.452	11	11 26 2.82	1.8276	9 1 55.9	12.051
12	9 57 22.06	1.9600	17 35 39.0	9.524	12	11 27 52.42	1.8258	8 49 51.8	12.086
13	9 59 19.55	1.9564	17 26 5.4	9.596	13	11 29 41.92	1.8241	8 37 45.6	12.121
14	10 1 16.83	1.9529	17 16 27.5	9.667	14	11 31 31.31	1.8224	8 25 37.3	12.155
15	10 3 13.90	1.9493	17 6 45.4	9.737	15	11 33 20.60	1.8208	8 13 27.0	12.188
16	10 5 10.75	1.9457	16 56 59.1	9.807	16	11 35 9.80	1.8192	8 1 14.8	12.220
17	10 7 7.39	1.9423	16 47 8.6	9.876	17	11 36 58.90	1.8176	7 49 0.6	12.252
18	10 9 3.83	1.9389	16 37 14.0	9.943	18	11 38 47.91	1.8161	7 36 44.5	12.283
19	10 11 0.06	1.9354	16 27 15.4	10.010	19	11 40 36.83	1.8147	7 24 26.6	12.313
20	10 12 56.08	1.9320	16 17 12.8	10.076	20	11 42 25.67	1.8133	7 12 6.9	12.343
21	10 14 51.90	1.9286	16 7 6.3	10.141	21	11 44 14.42	1.8119	6 59 45.4	12.372
22	10 16 47.51	1.9253	15 56 55.9	10.206	22	11 46 3.10	1.8106	6 47 22.2	12.400
23	10 18 42.93	1.9220	15 46 41.6	10.271	23	11 47 51.70	1.8094	6 34 57.4	12.428
24	10 20 38.15	1.9187	N.15 36 23.4	10.334	24	11 49 40.23	1.8083	N. 6 22 30.9	12.455

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 49 40.23	1.8083	N. 6 22 30.9	12.455
1	11 51 28.69	1.8072	6 10 2.8	12.481
2	11 53 17.09	1.8061	5 57 33.2	12.505
3	11 55 5.42	1.8050	5 45 2.2	12.529
4	11 56 53.69	1.8041	5 32 29.7	12.553
5	11 58 41.91	1.8032	5 19 55.8	12.577
6	12 0 30.08	1.8024	5 7 20.5	12.599
7	12 2 18.20	1.8016	4 54 43.9	12.621
8	12 4 6.27	1.8006	4 42 6.0	12.642
9	12 5 54.30	1.8002	4 29 26.9	12.662
10	12 7 42.29	1.7996	4 16 46.6	12.681
11	12 9 30.25	1.7991	4 4 5.2	12.700
12	12 11 18.18	1.7986	3 51 22.6	12.718
13	12 13 6.08	1.7981	3 38 39.0	12.735
14	12 14 53.95	1.7977	3 25 54.4	12.752
15	12 16 41.80	1.7973	3 13 8.8	12.768
16	12 18 29.63	1.7971	3 0 22.2	12.783
17	12 20 17.45	1.7969	2 47 34.8	12.798
18	12 22 5.26	1.7968	2 34 46.5	12.812
19	12 23 53.06	1.7967	2 21 57.4	12.824
20	12 25 40.86	1.7966	2 9 7.6	12.837
21	12 27 28.65	1.7966	1 56 17.0	12.849
22	12 29 16.45	1.7967	1 43 25.7	12.860
23	12 31 4.26	1.7969	N. 1 30 33.8	12.869

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 32 52.08	1.7971	N. 1 17 41.4	12.878
1	12 34 39.91	1.7973	1 4 48.4	12.887
2	12 36 27.76	1.7977	0 51 54.9	12.896
3	12 38 15.63	1.7981	0 39 0.9	12.903
4	12 40 3.53	1.7986	0 26 6.5	12.909
5	12 41 51.46	1.7990	0 13 11.8	12.915
6	12 43 39.41	1.7995	N. 0 0 16.7	12.921
7	12 45 27.40	1.8002	S. 0 12 38.7	12.925
8	12 47 15.44	1.8010	0 25 34.3	12.929
9	12 49 3.52	1.8017	0 38 30.1	12.932
10	12 50 51.64	1.8025	0 51 26.1	12.934
11	12 52 39.82	1.8034	1 4 22.2	12.936
12	12 54 28.05	1.8043	1 17 18.4	12.937
13	12 56 16.34	1.8053	1 30 14.6	12.937
14	12 58 4.69	1.8064	1 43 10.8	12.936
15	12 59 53.11	1.8076	1 56 6.9	12.934
16	13 1 41.60	1.8088	2 9 2.9	12.931
17	13 3 30.16	1.8100	2 21 58.7	12.928
18	13 5 18.80	1.8113	2 34 54.3	12.925
19	13 7 7.52	1.8127	2 47 49.7	12.922
20	13 8 56.33	1.8142	3 0 44.9	12.918
21	13 10 45.23	1.8157	3 13 39.8	12.911
22	13 12 34.22	1.8172	3 26 34.3	12.904
23	13 14 23.30	1.8188	3 39 28.3	12.897
24	13 16 12.48	1.8206	S. 3 52 21.9	12.889

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 16 12.48	1.8206	S. 3 52 21.9	12.889
1	13 18 1.77	1.8224	4 5 15.0	12.880
2	13 19 51.17	1.8242	4 18 7.5	12.870
3	13 21 40.68	1.8262	4 30 59.4	12.860
4	13 23 30.31	1.8282	4 43 50.7	12.849
5	13 25 20.06	1.8302	4 56 41.3	12.837
6	13 27 9.93	1.8323	5 9 31.2	12.825
7	13 28 59.93	1.8344	5 22 20.3	12.812
8	13 30 50.06	1.8367	5 35 8.6	12.797
9	13 32 40.33	1.8390	5 47 56.0	12.782
10	13 34 30.74	1.8413	6 0 42.5	12.767
11	13 36 21.29	1.8437	6 13 28.0	12.750
12	13 38 11.99	1.8462	6 26 12.5	12.733
13	13 40 2.84	1.8488	6 38 56.0	12.715
14	13 41 53.85	1.8514	6 51 38.3	12.696
15	13 43 45.01	1.8541	7 4 19.5	12.677
16	13 45 36.34	1.8569	7 16 59.5	12.656
17	13 47 27.84	1.8597	7 29 38.2	12.634
18	13 49 19.51	1.8626	7 42 15.6	12.612
19	13 51 11.35	1.8656	7 54 51.7	12.590
20	13 53 3.38	1.8687	8 7 26.4	12.566
21	13 54 55.59	1.8718	8 19 59.6	12.541
22	13 56 47.99	1.8749	8 32 31.3	12.515
23	13 58 40.58	1.8781	S. 8 45 1.4	12.488

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 0 33.36	1.8813	S. 8 57 29.9	12.462
1	14 2 26.34	1.8847	9 9 56.8	12.434
2	14 4 19.53	1.8882	9 22 22.0	12.405
3	14 6 12.92	1.8917	9 34 45.4	12.375
4	14 8 6.53	1.8952	9 47 7.0	12.345
5	14 10 0.35	1.8988	9 59 26.8	12.314
6	14 11 54.39	1.9026	10 11 44.7	12.282
7	14 13 48.66	1.9063	10 24 0.6	12.248
8	14 15 43.15	1.9101	10 36 14.5	12.214
9	14 17 37.87	1.9140	10 48 26.3	12.179
10	14 19 32.83	1.9180	11 0 36.0	12.144
11	14 21 28.03	1.9219	11 12 43.6	12.107
12	14 23 23.46	1.9259	11 24 48.9	12.069
13	14 25 19.14	1.9301	11 36 51.9	12.031
14	14 27 15.08	1.9344	11 48 52.6	11.992
15	14 29 11.27	1.9387	12 0 50.9	11.951
16	14 31 7.72	1.9430	12 12 46.7	11.909
17	14 33 4.43	1.9474	12 24 40.0	11.867
18	14 35 1.41	1.9519	12 36 30.7	11.823
19	14 36 58.66	1.9564	12 48 18.8	11.779
20	14 38 56.18	1.9610	13 0 4.2	11.734
21	14 40 53.98	1.9657	13 11 46.9	11.688
22	14 42 52.06	1.9704	13 23 26.8	11.641
23	14 44 50.43	1.9752	13 35 3.8	11.592
24	14 46 49.09	1.9801	S. 13 46 37.9	11.543

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter	Feb.	1	16	42.1
● New Moon		8	14	12.2
☽ First Quarter		15	6	29.5
○ Full Moon		23	7	18.4

		d	h
☾ Perigee	Feb.	9	0.3
☾ Apogee		23	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Pollux	W.	102° 12′ 32″	2870	103° 45′ 29″	2858	105° 18′ 42″	2844	106° 52′ 13″	2831
	Regulus	W.	66 5 58	2878	67 38 45	2865	69 11 49	2850	70 45 12	2836
	Saturn	W.	48 17 48	2852	49 51 8	2838	51 24 46	2824	52 58 43	2810
	Antares	E.	34 40 12	2915	33 8 12	2905	31 36 0	2897	30 3 37	2889
	Venus	E.	51 41 54	3227	50 16 17	3215	48 50 26	3203	47 24 20	3189
	Sun	E.	97 58 18	3247	96 33 4	3231	95 7 32	3217	93 41 43	3202
2	Regulus	W.	78 36 53	2760	80 12 14	2743	81 47 57	2726	83 24 2	2710
	Saturn	W.	60 53 16	2732	62 29 13	2716	64 5 31	2700	65 42 11	2683
	Spica	W.	24 58 49	2872	26 31 44	2844	28 5 15	2816	29 39 22	2790
	Venus	E.	40 9 50	3122	38 42 7	3108	37 14 7	3095	35 45 51	3081
	Sun	E.	86 27 54	3119	85 0 8	3102	83 32 1	3085	82 3 33	3066
3	Regulus	W.	91 30 12	2621	93 8 38	2603	94 47 29	2585	96 26 45	2566
	Saturn	W.	73 51 23	2594	75 30 26	2575	77 9 55	2557	78 49 49	2538
	Spica	W.	37 38 15	2669	39 15 36	2646	40 53 28	2624	42 31 50	2603
	Venus	E.	28 20 30	3020	26 50 42	3012	25 20 44	3005	23 50 38	3001
	Sun	E.	74 35 27	2972	73 4 39	2952	71 33 26	2932	70 1 48	2912
4	Saturn	W.	87 15 53	2443	88 58 26	2424	90 41 26	2405	92 24 54	2386
	Spica	W.	50 51 3	2496	52 32 22	2475	54 14 10	2454	55 56 28	2433
	Sun	E.	62 17 18	2811	60 43 5	2792	59 8 26	2772	57 33 22	2752
5	Spica	W.	64 35 12	2333	66 20 23	2315	68 6 1	2296	69 52 7	2277
	Antares	W.	18 57 31	2451	20 39 53	2409	22 23 15	2373	24 7 28	2341
	Sun	E.	49 31 27	2655	47 53 47	2636	46 15 41	2618	44 37 11	2601
6	Spica	W.	78 49 20	2190	80 38 3	2173	82 27 11	2158	84 16 42	2143
	Antares	W.	32 58 52	2218	34 46 53	2197	36 35 25	2178	38 24 26	2159
	Sun	E.	36 18 55	2522	34 38 13	2510	32 57 13	2497	31 15 56	2486
7	Spica	W.	93 29 44	2077	95 21 19	2065	97 13 12	2055	99 5 21	2044
	Antares	W.	47 36 1	2082	49 27 28	2068	51 19 16	2056	53 11 23	2045
	Sun	E.	22 46 33	2465	21 4 30	2470	19 22 35	2482	17 40 56	2502
10	Sun	W.	20 44 14	2397	22 27 53	2391	24 11 41	2387	25 55 34	2387
	Mars	E.	29 55 59	2253	28 8 51	2267	26 22 3	2283	24 35 39	2302
	α Arietis	E.	56 18 5	2153	54 28 27	2169	52 39 13	2186	50 50 24	2204
	Aldebaran	E.	86 9 37	2006	84 16 12	2014	82 22 59	2021	80 29 58	2030
11	Sun	W.	34 34 10	2414	36 17 25	2424	38 0 26	2434	39 43 12	2446
	α Arietis	E.	41 54 14	2330	40 8 58	2364	38 24 31	2401	36 40 57	2443
	Aldebaran	E.	71 8 37	2084	69 17 13	2097	67 26 9	2111	65 35 26	2124
	Pollux	E.	115 16 22	2073	113 24 42	2086	111 33 21	2099	109 42 20	2111
12	Sun	W.	48 12 30	2516	49 53 21	2531	51 33 51	2548	53 13 58	2565
	Aldebaran	E.	56 27 23	2202	54 38 58	2218	52 50 58	2237	51 3 25	2254
	Pollux	E.	100 32 25	2184	98 43 33	2200	96 55 5	2216	95 7 1	2232
13	Sun	W.	61 28 38	2653	63 6 21	2671	64 43 40	2689	66 20 34	2708
	α Pegasi	W.	40 34 56	3388	41 57 26	3333	43 20 59	3288	44 45 25	3248
	Aldebaran	E.	42 12 26	2350	40 27 40	2371	38 43 23	2391	36 59 36	2414

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Pollux W.	108° 26′ 1″	2816	110° 0′ 8″	2801	111° 34′ 35″	2786	113° 9′ 21″	2771
	Regulus W.	72 18 53	2821	73 52 53	2806	75 27 13	2791	77 1 53	2775
	SATURN W.	54 32 58	2795	56 7 32	2780	57 42 26	2764	59 17 41	2749
	Antares E.	28 31 4	2881	26 58 21	2876	25 25 31	2871	23 52 35	2866
	VENUS E.	45 57 58	3177	44 31 21	3163	43 4 27	3149	41 37 17	3135
	SUN E.	92 15 36	3186	90 49 10	3170	89 22 25	3153	87 55 20	3136
2	Regulus W.	85 0 29	2692	86 37 19	2675	88 14 33	2657	89 52 10	2639
	SATURN W.	67 19 14	2666	68 56 40	2648	70 34 30	2630	72 12 44	2612
	Spica W.	31 14 3	2764	32 49 18	2740	34 25 5	2716	36 1 24	2692
	VENUS E.	31 17 18	3068	32 48 29	3056	31 19 25	3043	29 50 5	3030
	SUN E.	80 34 42	3047	79 5 28	3029	77 35 51	3010	76 5 51	2991
3	Regulus W.	98 6 27	2547	99 46 35	2529	101 27 8	2510	103 8 8	2491
	SATURN W.	80 30 9	2520	82 10 55	2500	83 52 8	2482	85 33 47	2462
	Spica W.	44 10 41	2581	45 50 2	2559	47 29 53	2538	49 10 13	2517
	VENUS E.	22 20 27	3001	20 50 16	3004	19 20 8	3011	17 50 9	3023
	SUN E.	68 29 45	2893	66 57 17	2873	65 24 23	2852	63 51 3	2833
4	SATURN W.	94 8 49	2367	95 53 11	2348	97 38 1	2329	99 23 18	2310
	Spica W.	57 39 15	2413	59 22 31	2393	61 6 16	2373	62 50 30	2353
	SUN E.	55 57 51	2732	54 21 54	2712	52 45 30	2693	51 8 41	2675
5	Spica W.	71 38 41	2258	73 25 42	2241	75 13 9	2223	77 1 2	2206
	Antares W.	25 52 28	2313	27 38 9	2287	29 24 28	2262	31 11 23	2239
	SUN E.	42 58 17	2583	41 18 59	2567	39 39 19	2551	37 59 17	2537
6	Spica W.	86 6 36	2128	87 56 52	2115	89 47 29	2101	91 38 27	2088
	Antares W.	40 13 55	2142	42 3 50	2125	43 54 11	2110	45 44 55	2096
	SUN E.	29 34 23	2477	27 52 37	2470	26 10 41	2465	24 28 38	2463
7	Spica W.	100 57 46	2035	102 50 25	2027	104 43 17	2020	106 36 20	2013
	Antares W.	55 3 47	2034	56 56 28	2025	58 49 23	2016	60 42 32	2009
	SUN E.	15 59 45	2635	14 19 20	2585	12 40 5	2546	11 2 39	2505
10	SUN W.	27 39 28	2389	29 23 19	2392	31 7 5	2398	32 50 43	2405
	MARS E.	22 49 42	2324	21 4 17	2349	19 19 29	2379	17 35 24	2413
	α Arietis E.	49 2 3	2225	47 14 12	2247	45 26 55	2272	43 40 14	2300
	Aldebaran E.	78 37 10	2039	76 41 37	2050	74 52 20	2061	73 0 20	2072
11	SUN W.	41 25 41	2459	43 7 52	2472	44 49 45	2486	46 31 18	2501
	α Arietis E.	34 58 23	2489	33 16 54	2542	31 36 39	2601	29 57 46	2669
	Aldebaran E.	63 45 4	2139	61 55 4	2154	60 5 27	2169	58 16 13	2185
	Pollux E.	107 51 38	2125	106 1 17	2139	104 11 17	2154	102 21 40	2169
12	SUN W.	54 53 41	2582	56 33 1	2599	58 11 58	2617	59 50 30	2635
	Aldebaran E.	49 16 18	2272	47 29 38	2291	45 43 26	2311	43 57 42	2330
	Pollux E.	93 19 21	2249	91 32 6	2265	89 45 15	2283	87 58 50	2300
13	SUN W.	67 57 3	2727	69 33 7	2746	71 8 46	2765	72 44 0	2783
	α Pegasi W.	46 10 37	3215	47 36 28	3188	49 2 51	3166	50 29 41	3148
	Aldebaran E.	35 16 21	2436	33 33 38	2459	31 51 27	2483	30 9 50	2507

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
13	Pollux	E.	86° 12′ 50″	2317	84° 27′ 16″	2335	82° 42′ 7″	2353	80° 57′ 24″	2370
	Regulus	E.	122 19 16	2328	120 33 57	2344	118 49 2	2362	117 4 32	2378
14	SUN	W.	74 18 50	2802	75 53 15	2821	77 27 15	2839	79 0 52	2859
	α Pegasi	W.	51 56 53	3132	53 24 24	3120	54 52 9	3111	56 20 5	3104
	MARS	W.	25 48 48	2748	27 24 24	2761	28 59 43	2775	30 34 44	2788
	Pollux	E.	72 20 11	2460	70 38 1	2477	68 56 15	2494	67 14 54	2512
	Regulus	E.	108 28 11	2465	106 46 9	2482	105 4 31	2500	103 23 18	2517
15	SUN	W.	86 42 58	2948	88 14 14	2967	89 45 8	2985	91 15 40	3002
	α Pegasi	W.	63 41 3	3098	65 9 15	3101	66 37 24	3105	68 5 28	3110
	MARS	W.	38 25 5	2864	39 58 10	2879	41 30 56	2894	43 3 22	2910
	Pollux	E.	58 54 14	2599	57 15 17	2615	55 36 42	2632	53 58 30	2648
	Regulus	E.	95 3 4	2601	93 24 10	2618	91 45 39	2633	90 7 29	2649
16	SUN	W.	98 43 4	3085	100 11 32	3100	101 39 42	3115	103 7 33	3131
	α Pegasi	W.	75 24 1	3144	76 51 17	3153	78 18 22	3163	79 45 16	3172
	MARS	W.	50 40 42	2985	52 11 14	2999	53 41 28	3013	55 11 25	3027
	α Arietis	W.	31 45 56	3120	33 13 41	3101	34 41 49	3087	36 10 15	3074
	Pollux	E.	45 52 56	2727	44 16 52	2742	42 41 8	2757	41 5 44	2772
	Regulus	E.	82 1 56	2725	80 25 49	2740	78 50 2	2753	77 14 33	2768
17	SUN	W.	110 22 20	3201	111 48 28	3214	113 14 20	3228	114 39 56	3240
	α Pegasi	W.	86 56 51	3224	88 22 32	3235	89 48 0	3246	91 13 15	3258
	α Arietis	W.	43 35 3	3050	45 4 14	3049	46 33 26	3049	48 2 38	3051
	Pollux	E.	33 13 32	2844	31 40 1	2859	30 6 49	2873	28 33 56	2887
	Regulus	E.	69 21 36	2833	67 17 51	2845	66 14 21	2857	64 41 7	2868
	Spica	E.	123 22 9	2850	121 48 46	2860	120 15 36	2870	118 42 39	2861
18	SUN	W.	121 44 24	3300	123 8 36	3309	124 32 37	3319	125 56 26	3331
	α Pegasi	W.	98 16 0	3319	99 39 50	3332	101 3 24	3345	102 26 43	3358
	α Arietis	W.	55 28 0	3065	56 56 53	3068	58 25 42	3072	59 54 26	3075
	Aldebaran	W.	24 8 52	3004	25 39 0	3004	27 9 8	3004	28 39 16	3004
	Regulus	E.	56 58 29	2922	55 26 38	2932	53 55 0	2942	52 23 34	2950
	SATURN	E.	73 30 46	2883	71 58 5	2891	70 25 35	2901	68 53 17	2909
	Spica	E.	111 1 9	2929	109 29 27	2937	107 57 55	2946	106 26 34	2954
19	α Pegasi	W.	109 19 19	3432	110 40 59	3448	112 2 21	3465	113 23 24	3482
	α Arietis	W.	67 16 53	3096	68 45 7	3101	70 13 16	3105	71 41 19	3109
	Aldebaran	W.	36 9 26	3018	37 39 17	3022	39 9 3	3025	40 38 45	3029
	Regulus	E.	44 49 14	2995	43 18 55	3003	41 48 46	3012	40 18 48	3020
	SATURN	E.	61 14 22	2948	59 43 4	2954	58 11 54	2962	56 40 53	2969
	Spica	E.	98 52 19	2991	97 21 55	2998	95 51 40	3004	94 21 32	3010
20	α Arietis	W.	79 0 25	3129	80 28 0	3132	81 55 31	3135	83 22 58	3139
	Aldebaran	W.	48 6 6	3047	49 35 21	3050	51 4 32	3053	52 33 39	3056
	Regulus	E.	32 51 29	3061	31 22 32	3070	29 53 46	3079	28 25 11	3089
	SATURN	E.	49 7 46	2997	47 37 29	3002	46 7 19	3007	44 37 15	3012
	Spica	E.	86 52 43	3038	85 23 17	3043	83 53 57	3047	82 24 42	3052
21	α Arietis	W.	90 39 8	3156	92 6 10	3158	93 33 9	3162	95 0 4	3165
	Aldebaran	W.	59 58 19	3070	61 27 5	3073	62 55 48	3074	64 24 29	3076

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Pollux	E.	79° 13′ 6″	2388	77° 29′ 14″	2406	75° 45′ 48″	2424	74° 2′ 47″	2441
	Regulus	E.	115 20 26	2396	113 36 45	2413	111 53 29	2431	110 10 38	2448
14	Sun	W.	80 34 4	2877	82 6 52	2895	83 39 17	2913	85 11 19	2931
	α Pegasi	W.	57 48 10	3100	59 16 20	3096	60 44 34	3096	62 12 49	3096
	Mars	W.	32 9 27	2803	33 43 51	2818	35 17 55	2833	36 51 40	2848
	Pollux	E.	65 33 58	2530	63 53 26	2547	62 13 18	2564	60 33 34	2582
	Regulus	E.	101 42 28	2534	100 2 2	2551	98 22 0	2568	96 42 21	2584
15	Sun	W.	92 45 50	3019	94 15 39	3035	95 45 8	3052	97 14 16	3069
	α Pegasi	W.	69 33 26	3115	71 1 17	3121	72 29 1	3129	73 56 36	3137
	Mars	W.	44 35 28	2925	46 7 15	2940	47 38 43	2955	49 9 52	2970
	Pollux	E.	52 20 40	2664	50 43 12	2681	49 6 6	2696	47 29 21	2711
	Regulus	E.	88 29 41	2665	86 52 14	2681	85 15 8	2695	83 38 22	2710
16	Sun	W.	104 35 5	3146	106 2 19	3159	107 29 17	3174	108 55 57	3188
	α Pegasi	W.	81 11 59	3182	82 38 30	3191	84 4 50	3202	85 30 57	3213
	Mars	W.	56 41 4	3040	58 10 27	3054	59 39 33	3067	61 8 23	3080
	α Arietis	W.	37 38 56	3065	39 7 48	3059	40 36 48	3054	42 5 54	3052
	Pollux	E.	39 30 40	2787	37 55 55	2801	36 21 29	2815	34 47 21	2830
	Regulus	E.	75 39 23	2781	74 4 30	2795	72 29 55	2808	70 55 37	2821
17	Sun	W.	116 5 18	3253	117 30 25	3265	118 55 18	3276	120 19 57	3287
	α Pegasi	W.	92 38 16	3269	94 3 4	3282	95 27 37	3294	96 51 56	3306
	α Arietis	W.	49 31 48	3052	51 0 56	3055	52 30 1	3058	53 59 2	3060
	Pollux	E.	27 1 21	2903	25 29 6	2918	23 57 10	2934	22 25 34	2950
	Regulus	E.	63 8 7	2880	61 35 22	2891	60 2 51	2901	58 30 33	2912
	Spica	E.	117 9 56	2891	115 37 26	2901	114 5 8	2911	112 33 3	2920
18	Sun	W.	127 20 2	3341	128 43 28	3351	130 6 41	3359	131 29 44	3368
	α Pegasi	W.	103 49 47	3372	105 12 35	3387	106 35 6	3401	107 57 21	3416
	α Arietis	W.	61 23 6	3079	62 51 41	3084	64 20 10	3088	65 48 34	3092
	Aldebaran	W.	30 9 24	3006	31 39 29	3008	33 9 32	3011	34 39 31	3014
	Regulus	E.	50 52 19	2960	49 21 16	2969	47 50 24	2978	46 19 44	2986
	Saturn	E.	67 21 10	2918	65 49 14	2925	64 17 27	2933	62 45 50	2940
	Spica	E.	104 55 24	2962	103 24 24	2969	101 53 33	2977	100 22 52	2984
19	α Pegasi	W.	114 44 8	3501	116 4 31	3519	117 24 34	3539	118 44 15	3560
	α Arietis	W.	73 9 18	3113	74 37 12	3117	76 5 1	3121	77 32 45	3124
	Aldebaran	W.	42 8 22	3032	43 37 55	3036	45 7 23	3039	46 36 47	3043
	Regulus	E.	38 49 0	3028	37 19 22	3036	35 49 54	3044	34 20 36	3053
	Saturn	E.	55 10 1	2974	53 39 16	2981	52 8 39	2986	50 38 9	2992
	Spica	E.	92 51 32	3016	91 21 39	3022	89 51 54	3027	88 22 15	3033
20	α Arietis	W.	84 50 20	3143	86 17 38	3146	87 44 52	3149	89 12 2	3153
	Aldebaran	W.	54 2 42	3060	55 31 41	3062	57 0 37	3065	58 29 30	3068
	Regulus	E.	26 56 48	3100	25 28 38	3110	24 0 41	3124	22 33 0	3139
	Saturn	E.	43 7 17	3016	41 37 24	3021	40 7 37	3025	38 37 55	3030
	Spica	E.	80 55 33	3056	79 26 29	3060	77 57 30	3064	76 28 36	3067
21	α Arietis	W.	96 26 55	3168	97 53 43	3171	99 20 27	3173	100 47 8	3177
	Aldebaran	W.	65 53 8	3078	67 21 45	3080	68 50 19	3082	70 18 51	3083

GREENWICH MEAN TIME.

LUNAR DISTANCES

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	Pollux	W.	15° 56′ 37″	3142	17° 23′ 56″	3130	18° 51′ 29″	3122	20° 19′ 12″	3115
	SATURN	E.	37 8 19	3034	35 38 48	3037	34 9 21	3041	32 39 59	3046
	Spica	E.	74 59 46	3070	73 31 0	3073	72 2 18	3077	70 33 40	3080
	Antares	E.	120 53 40	3067	119 24 50	3069	117 56 2	3071	116 27 17	3073
22	α Arietis	W.	102 13 45	3179	103 40 19	3183	105 6 49	3185	106 33 16	3188
	Aldebaran	W.	71 47 21	3084	73 15 50	3086	74 44 17	3087	76 12 43	3087
	Pollux	W.	27 39 19	3098	29 7 31	3097	30 35 44	3096	32 3 59	3095
	Spica	E.	63 11 22	3093	61 43 4	3095	60 14 48	3097	58 46 35	3099
	Antares	E.	109 4 7	3081	107 35 34	3082	106 7 3	3083	104 38 33	3084
23	Aldebaran	W.	83 34 42	3090	85 3 4	3090	86 31 26	3090	87 59 48	3089
	Pollux	W.	39 25 32	3090	40 53 54	3088	42 22 18	3087	43 50 43	3087
	Spica	E.	51 26 4	3108	49 58 4	3110	48 30 7	3111	47 2 11	3114
	Antares	E.	97 16 16	3087	95 47 50	3087	94 19 24	3087	92 50 58	3086
24	Aldebaran	W.	95 21 47	3087	96 50 13	3085	98 18 41	3084	99 47 10	3083
	Pollux	W.	51 13 8	3080	52 41 42	3078	54 10 18	3077	55 38 56	3074
	Regulus	W.	15 31 30	3239	16 56 53	3211	18 22 49	3189	19 49 11	3171
	Spica	E.	39 43 8	3124	38 15 27	3127	36 47 50	3129	35 20 16	3132
	Antares	E.	85 28 38	3083	84 0 8	3082	82 31 36	3080	81 3 2	3079
	VENUS	E.	125 33 26	3512	124 13 15	3510	122 53 2	3507	121 32 46	3506
25	Aldebaran	W.	107 10 2	3074	108 38 43	3072	110 7 27	3069	111 36 14	3067
	Pollux	W.	63 2 47	3063	64 31 42	3060	66 0 41	3057	67 29 43	3054
	Regulus	W.	27 5 27	3114	28 33 20	3105	30 1 23	3098	31 29 35	3091
	Spica	E.	28 3 37	3159	26 36 39	3168	25 9 52	3179	23 43 18	3192
	Antares	E.	73 39 45	3069	72 10 58	3068	70 42 9	3065	69 13 16	3062
	VENUS	E.	114 50 47	3492	113 30 14	3488	112 9 37	3486	110 48 57	3483
26	Pollux	W.	74 55 57	3035	76 25 26	3030	77 55 1	3026	79 24 41	3022
	Regulus	W.	38 52 35	3060	40 21 34	3053	41 50 41	3047	43 19 56	3041
	SATURN	W.	22 49 30	3032	24 19 3	3024	25 48 46	3017	27 18 38	3009
	Antares	E.	61 48 0	3047	60 18 45	3043	58 49 25	3039	57 20 1	3034
	VENUS	E.	104 4 34	3462	102 43 27	3457	101 22 15	3453	100 0 58	3447
	α Aquilæ	E.	107 43 34	3886	106 30 0	3867	105 16 7	3851	104 1 57	3836
27	Pollux	W.	86 54 36	2994	88 24 56	2988	89 55 24	2981	91 26 0	2975
	Regulus	W.	50 48 5	3008	52 18 8	3001	53 48 19	2994	55 18 39	2986
	SATURN	W.	34 50 12	2974	36 20 57	2966	37 51 52	2959	39 22 56	2952
	Antares	E.	49 51 39	3013	48 21 42	3007	46 51 38	3002	45 21 28	2997
	VENUS	E.	93 12 59	3418	91 51 3	3411	90 28 59	3404	89 6 47	3396
	α Aquilæ	E.	97 47 30	3771	96 31 58	3760	95 16 14	3750	94 0 20	3741
	SUN	E.	139 26 9	3404	138 3 57	3394	136 41 34	3386	135 19 2	3377
28	Pollux	W.	99 1 14	2937	100 32 46	2928	102 4 29	2920	103 36 23	2910
	Regulus	W.	62 52 47	2946	64 24 8	2937	65 55 40	2927	67 27 24	2918
	SATURN	W.	47 0 42	2911	48 32 47	2902	50 5 3	2893	51 37 31	2883
	Antares	E.	37 48 55	2969	36 18 4	2964	34 47 6	2958	33 16 1	2954
	VENUS	E.	82 13 38	3357	80 50 32	3347	79 27 15	3338	78 3 48	3330
	α Aquilæ	E.	87 38 31	3702	86 21 46	3696	85 4 55	3692	83 47 59	3687
	SUN	E.	128 23 42	3330	127 0 5	3319	125 36 15	3309	124 12 14	3298

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
21	Pollux	W.	21° 47′ 3″	3110	23° 15′ 0″	3105	24° 43′ 3″	3103	26° 11′ 9″	3100
	SATURN	E.	31 10 43	3050	29 41 32	3053	28 12 25	3057	26 43 23	3062
	Spica	E.	69 5 6	3082	67 36 35	3086	66 8 8	3087	64 39 43	3091
	Antares	E.	114 58 35	3075	113 29 55	3077	112 1 17	3078	110 32 41	3080
22	α Arietis	W.	107 59 40	3191	109 26 0	3193	110 52 17	3197	112 18 30	3200
	Aldebaran	W.	77 41 9	3086	79 9 33	3088	80 37 57	3089	82 6 20	3090
	Pollux	W.	33 32 15	3094	35 0 32	3092	36 28 51	3091	37 57 11	3091
	Spica	E.	57 18 24	3101	55 50 16	3103	54 22 10	3105	52 54 6	3106
	Antares	E.	103 10 4	3065	101 41 36	3066	100 13 9	3066	98 44 42	3067
23	Aldebaran	W.	89 28 11	3089	90 56 34	3089	92 24 57	3087	93 53 22	3087
	Pollux	W.	45 19 9	3086	46 47 36	3084	48 16 5	3082	49 44 36	3082
	Spica	E.	45 34 18	3115	44 6 27	3117	42 38 38	3119	41 10 52	3121
	Antares	E.	91 22 31	3066	89 54 4	3065	88 25 36	3064	86 57 7	3064
24	Aldebaran	W.	101 15 40	3082	102 44 12	3079	104 12 47	3078	105 41 23	3076
	Pollux	W.	57 7 37	3073	58 36 20	3070	60 5 6	3068	61 33 55	3065
	Regulus	W.	21 15 55	3156	22 42 57	3143	24 10 14	3133	25 37 44	3122
	Spica	E.	33 52 45	3136	32 25 19	3140	30 57 58	3146	29 30 44	3152
	Antares	E.	79 34 27	3077	78 5 49	3076	76 37 10	3074	75 8 29	3072
	VENUS	E.	120 12 28	3503	118 52 7	3500	117 31 43	3498	116 11 17	3495
25	Aldebaran	W.	113 5 4	3065	114 33 57	3061	116 2 54	3058	117 31 55	3056
	Pollux	W.	68 58 49	3051	70 27 59	3047	71 57 14	3043	73 26 33	3039
	Regulus	W.	32 57 55	3084	34 26 24	3078	35 55 0	3072	37 23 44	3066
	Spica	E.	22 16 59	3909	20 51 0	3930	19 25 26	3958	18 0 25	3992
	Antares	E.	67 44 20	3060	66 15 21	3056	64 46 18	3053	63 17 11	3050
	VENUS	E.	109 28 13	3479	108 7 25	3475	106 46 33	3471	105 25 36	3466
26	Pollux	W.	80 54 27	3017	82 24 19	3011	83 54 18	3006	85 24 23	3000
	Regulus	W.	44 49 18	3034	46 18 48	3028	47 48 26	3022	49 18 11	3015
	SATURN	W.	28 48 39	3002	30 18 49	2995	31 49 8	2988	33 19 36	2981
	Antares	E.	55 50 31	3030	54 20 56	3026	52 51 16	3022	51 21 30	3018
	VENUS	E.	98 39 35	3442	97 18 6	3437	95 56 31	3430	94 34 48	3424
	α Aquilæ	E.	102 47 32	3821	101 32 52	3808	100 17 58	3794	99 2 50	3783
27	Pollux	W.	92 56 44	2968	94 27 37	2960	95 58 40	2953	97 29 52	2945
	Regulus	W.	56 49 9	2979	58 19 48	2971	59 50 37	2962	61 21 37	2954
	SATURN	W.	40 54 9	2944	42 25 32	2936	43 57 5	2928	45 28 48	2920
	Antares	E.	43 51 11	2991	42 20 47	2986	40 50 17	2980	39 19 39	2975
	VENUS	E.	87 44 27	3389	86 21 58	3382	84 59 21	3373	83 36 34	3365
	α Aquilæ	E.	92 44 16	3731	91 28 2	3724	90 11 40	3715	88 55 9	3709
	SUN	E.	133 56 19	3368	132 33 26	3359	131 10 23	3349	129 47 8	3339
28	Pollux	W.	105 8 29	2901	106 40 46	2891	108 13 16	2882	109 45 58	2872
	Regulus	W.	68 59 20	2909	70 31 28	2898	72 3 49	2888	73 36 23	2878
	SATURN	W.	53 10 12	2873	54 43 5	2864	56 16 10	2854	57 49 28	2843
	Antares	E.	31 41 50	2949	30 13 33	2944	28 42 10	2940	27 10 42	2936
	VENUS	E.	76 40 9	3319	75 16 20	3308	73 52 18	3298	72 28 4	3288
	α Aquilæ	E.	82 30 58	3683	81 13 53	3680	79 56 45	3677	78 39 34	3677
	SUN	E.	122 48 0	3287	121 23 33	3276	119 58 53	3264	118 33 59	3253

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	22 48 35.61	9.362	S. 7 34 33.5	+56.98	16 10.48	65.44	12 32.82	0.494
Mon.	2	22 52 20 04	9.342	7 11 42.8	57.26	16 10.23	65.37	12 20.73	0.514
Tues.	3	22 56 3.99	9.322	6 48 46.0	57.49	16 9.98	65.30	12 8.16	0.534
Wed.	4	22 59 47.48	9.304	6 25 43.3	+57.72	16 9.73	65.23	11 55.14	0.552
Thur.	5	23 3 30.54	9.286	6 2 35.2	57.94	16 9.47	65.16	11 41.68	0.570
Frid.	6	23 7 13.18	9.268	5 39 22.0	58.14	16 9.21	65.10	11 27.81	0.587
Sat.	7	23 10 55.42	9.252	5 16 4.1	+58.33	16 8.95	65.04	11 13.53	0.603
SUN.	8	23 14 37.27	9.236	4 52 42.0	58.50	16 8.69	64.98	10 58.87	0.619
Mon.	9	23 18 18.74	9.221	4 29 16.0	58.66	16 8.43	64.93	10 43.83	0.634
Tues.	10	23 21 59.87	9.207	4 5 46.5	+58.79	16 8.17	64.88	10 28.45	0.648
Wed.	11	23 25 40.67	9.193	3 42 14.0	58.91	16 7.91	64.83	10 12.73	0.662
Thur.	12	23 29 21.14	9.180	3 18 38.9	59.01	16 7.65	64.78	9 56.69	0.675
Frid.	13	23 33 1.30	9.167	2 55 1.5	+59.10	16 7.39	64.74	9 40.34	0.688
Sat.	14	23 36 41.18	9.155	2 31 22.3	59.17	16 7.13	64.70	9 23.71	0.700
SUN.	15	23 40 20.78	9.145	2 7 41.6	59.22	16 6.86	64.66	9 6.80	0.711
Mon.	16	23 44 0.13	9.135	1 43 59.9	+59.25	16 6.60	64 63	8 49.64	0.721
Tues.	17	23 47 39.25	9.125	1 20 17.5	59.26	16 6.33	64.60	8 32.27	0 730
Wed.	18	23 51 18.17	9.117	0 56 34.7	59.27	16 6.07	64.57	8 14.68	0.738
Thur.	19	23 54 56.88	9.110	0 32 52.0	+59.27	16 5.80	64.55	7 56.88	0.745
Frid.	20	23 58 35.43	9.104	S. 0 9 9.8	59.25	16 5.53	64.53	7 38.92	0.751
Sat.	21	0 2 13.83	9.098	N. 0 14 31.7	59.21	16 5.26	64.51	7 20.83	0.757
SUN.	22	0 5 52.12	9.093	0 38 12.0	+59.16	16 4.99	64.49	7 2.61	0.762
Mon.	23	0 9 30.30	9.089	1 1 50.8	59.09	16 4.72	64.48	6 44.29	0.766
Tues.	24	0 13 8.40	9.087	1 25 27.7	59.01	16 4.44	64.48	6 25.89	0.768
Wed.	25	0 16 46.44	9.085	1 49 2.5	+58.91	16 4.16	64.47	6 7.42	0.769
Thur.	26	0 20 24.46	9.084	2 12 34.9	58.80	16 3.88	64.47	5 48.94	0.770
Frid.	27	0 24 2.48	9.084	2 36 4.5	58.67	16 3.60	64.47	5 30.46	0.771
Sat.	28	0 27 40.51	9.086	2 59 30.9	+58.53	16 3.32	64.47	5 11.99	0.769
SUN.	29	0 31 18.58	9.088	3 22 53.9	58.38	16 3.04	64.48	4 53.56	0.767
Mon.	30	0 34 56.72	9.091	3 46 13.1	58.22	16 2.76	64.49	4 35.20	0.764
Tues.	31	0 38 34.95	9.095	4 9 28.2	58.04	16 2.47	64.50	4 16.93	0.760
Wed.	32	0 42 13.28	9.100	N. 4 32 38.8	+57.85	16 2.19	64.51	3 58.76	0.755

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	22 48 33.65	9.363	S. 7 34 45.4	+56.98	12 32.92	0.494	22 36 0.73
Mon.	2	22 52 18.11	9.343	7 11 54.6	57.25	12 20.83	0.514	22 39 57.28
Tues.	3	22 56 2.10	9.323	6 48 57.6	57.50	12 8.26	0.534	22 43 53.84
Wed.	4	22 59 45.63	9.305	6 25 54.8	+57.73	11 55.24	0.552	22 47 50.39
Thur.	5	23 3 28.73	9.287	6 2 46.5	57.95	11 41.79	0.570	22 51 46.94
Frid.	6	23 7 11.41	9.270	5 39 33.1	58.15	11 27.92	0.587	22 55 43.49
Sat.	7	23 10 53.69	9.254	5 16 15.0	+58.34	11 13.64	0.603	22 59 40.05
SUN.	8	23 14 35.58	9.238	4 52 52.7	58.51	10 58.98	0.619	23 3 36.60
Mon.	9	23 18 17.10	9.223	4 29 26.5	58.67	10 43.94	0.634	23 7 33.16
Tues.	10	23 21 58.27	9.209	4 5 56.8	+58.80	10 28.56	0.648	23 11 29.71
Wed.	11	23 25 39.11	9.195	3 42 24.1	58.92	10 12.84	0.662	23 15 26.27
Thur.	12	23 29 19.62	9.182	3 18 48.7	59.02	9 56.80	0.675	23 19 22.82
Frid.	13	23 32 59.82	9.169	2 55 11.0	+59.11	9 40.45	0.688	23 23 19.37
Sat.	14	23 36 39.74	9.157	2 31 31.5	59.18	9 23.82	0.700	23 27 15.92
SUN.	15	23 40 19.39	9.146	2 7 50.6	59.23	9 6.91	0.711	23 31 12.48
Mon.	16	23 43 58.78	9.136	1 44 8.6	+59.25	8 49.75	0.721	23 35 9.03
Tues.	17	23 47 37.95	9.127	1 20 25.9	59.27	8 32.37	0.730	23 39 5.58
Wed.	18	23 51 16.91	9.119	0 56 42.9	59.28	8 14.78	0.738	23 43 2.13
Thur.	19	23 54 55.67	9.112	0 32 59.9	+59.28	7 56.98	0.745	23 46 58.69
Frid.	20	23 58 34.26	9.106	S. 0 9 17.4	59.26	7 39.02	0.751	23 50 55.24
Sat.	21	0 2 12.71	9.100	N. 0 14 24.4	59.22	7 20.92	0.757	23 54 51.79
SUN.	22	0 5 51.04	9.095	0 38 5.0	+59.17	7 2.70	0.762	23 58 48.34
Mon.	23	0 9 29.27	9.092	1 1 44.0	59.10	6 44.37	0.766	0 2 44.90
Tues.	24	0 13 7.42	9.089	1 25 21.3	59.02	6 25.97	0.768	0 6 41.45
Wed.	25	0 16 45.51	9.087	1 48 56.5	+58.92	6 7.50	0.769	0 10 38.01
Thur.	26	0 20 23.58	9.086	2 12 29.2	58.81	5 49.02	0.770	0 14 34.56
Frid.	27	0 24 1.64	9.086	2 35 59.1	58.68	5 30.53	0.771	0 18 31.11
Sat.	28	0 27 39.72	9.088	2 59 25.9	+58.54	5 12.06	0.769	0 22 27.66
SUN.	29	0 31 17.84	9.090	3 22 49.2	58.39	4 53.62	0.767	0 26 24.22
Mon.	30	0 34 56.03	9.093	3 46 8.7	58.23	4 35.26	0.764	0 30 20.77
Tues.	31	0 38 34.30	9.097	4 9 21.1	58.05	4 16.98	0.760	0 34 17.32
Wed.	32	0 42 12.68	9.102	N. 4 32 35.0	+57.86	3 58.81	0.755	0 38 13.87

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour, +9^s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	60	340 39 9.4	39 16.5	150.43	+ 0.26	9.9961859	+46.5	1 23 45.51
2	61	341 39 18.8	39 25.8	150.37	+ 0.13	9.9962982	47.0	1 19 49.60
3	62	342 39 26.6	39 33.5	150.30	– 0.01	9.9964116	47.5	1 15 53.69
4	63	343 39 32.9	39 39.7	150.23	– 0.13	9.9965260	+47.9	1 11 57.78
5	64	344 39 37.6	39 44.3	150.16	0.25	9.9966412	48.2	1 8 1.88
6	65	345 39 40.7	39 47.3	150.09	0.36	9.9967571	48.4	1 4 5.98
7	66	346 39 42.2	39 48.7	150.03	– 0.44	9.9968735	+48.6	1 0 10.07
8	67	347 39 41.9	39 48.3	149.96	0.49	9.9969903	48.7	0 56 14.16
9	68	348 39 39.8	39 46.1	149.88	0.51	9.9971074	48.8	0 52 18.25
10	69	349 39 35.8	39 42.0	149.80	– 0.51	9.9972247	+48.9	0 48 22.34
11	70	350 39 29.9	39 36.0	149.71	0.48	9.9973422	49.0	0 44 26.43
12	71	351 39 21.9	39 27.9	149.62	0.41	9.9974598	49.0	0 40 30.52
13	72	352 39 11.8	39 17.7	149.53	– 0.32	9.9975776	+49.1	0 36 34.62
14	73	353 38 59.6	39 5.4	149.44	0.21	9.9976956	49.2	0 32 38.71
15	74	354 38 45.2	38 50.9	149.35	– 0.09	9.9978138	49.3	0 28 42.80
16	75	355 38 28.5	38 34.1	149.26	+ 0.04	9.9979322	+49.4	0 24 46.89
17	76	356 38 9.5	38 15.0	149.16	0.19	9.9980510	49.6	0 20 50.99
18	77	357 37 48.2	37 53.6	149.07	0.32	9.9981703	49.8	0 16 55.09
19	78	358 37 24.7	37 30.0	148.97	+ 0.43	9.9982902	+50.0	0 12 59.18
20	79	359 36 58.9	37 4.1	148.88	0.52	9.9984107	50.3	0 9 3.28
21	80	0 36 30.8	36 35.8	148.78	0.59	9.9985320	50.7	0 5 7.37
22	81	1 36 0.4	36 5.3	148.69	+ 0.64	9.9986541	+51.0	0 1 11.46 23 57 15.55
23	82	2 35 27.8	35 32.6	148.60	0.65	9.9987770	51.3	23 53 19.64
24	83	3 34 53.1	34 57.8	148.51	0.63	9.9989007	51.6	23 49 23.73
25	84	4 34 16.3	34 20.9	148.43	+ 0.59	9.9990252	+52.0	23 45 27.82
26	85	5 33 37.5	33 42.0	148.34	0.52	9.9991506	52.4	23 41 31.91
27	86	6 32 56.7	33 1.1	148.26	0.43	9.9992768	52.7	23 37 36.01
28	87	7 32 13.9	32 18.2	148.18	+ 0.31	9.9994037	+53.0	23 33 40.11
29	88	8 31 29.3	31 33.5	148.10	0.18	9.9995312	53.2	23 29 44.20
30	89	9 30 42.9	30 47.0	148.02	+ 0.05	9.9996590	53.3	23 25 48.29
31	90	10 29 54.7	29 58.7	147.95	– 0.08	9.9997871	53.4	23 21 52.39
32	91	11 29 4.7	29 8.6	147.88	– 0.20	9.9999155	+53.4	23 17 56.48

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 9.5	15 14.6	55 31.1	+1.48	55 49.8	+1.63	16 41.9	1.97	20.4
2	15 20.1	15 26.2	56 10.2	1.78	56 32.4	1.92	17 31.1	2.14	21.4
3	15 32.6	15 39.5	56 56.2	2.04	57 21.4	2.14	18 24.5	2.31	22.4
4	15 46.7	15 54.0	57 47.7	+2.23	58 14.8	+2.28	19 22.1	2.46	23.4
5	16 1.5	16 8.9	58 42.2	2.28	59 9.4	2.24	20 22.8	2.55	24.4
6	16 16.1	16 22.9	59 35.8	2.14	60 0.8	2.00	21 24.6	2.55	25.4
7	16 29.1	16 34.6	60 23.7	+1.79	60 43.7	+1.52	22 25.4	2.48	26.4
8	16 39.1	16 42.5	61 0.2	1.21	61 12.6	0.84	23 23.7	2.37	27.4
9	16 44.6	16 45.4	61 20.4	+0.45	61 23.3	+0.03	δ .		28.4
10	16 44.8	16 42.8	61 21.1	−0.40	61 13.8	−0.81	0 19.8	2.27	0.0
11	16 39.5	16 35.0	61 1.7	1.20	60 45.1	1.54	1 12.5	2.19	1.0
12	16 29.4	16 23.0	60 24.7	1.83	60 1.1	2.07	2 4.4	2.15	2.0
13	16 15.9	16 8.3	59 35.0	−2.25	59 7.1	−2.37	2 55.5	2.14	3.0
14	16 0.4	15 52.4	58 38.1	2.43	58 8.8	2.44	3 47.1	2.16	4.0
15	15 44.5	15 36.8	57 39.7	2.39	57 11.4	2.31	4 39.4	2.20	5.0
16	15 29.4	15 22.5	56 44.3	−2.19	56 18.8	−2.05	5 32.5	2.22	6.0
17	15 16.0	15 10.1	55 55.1	1.89	55 33.5	1.71	6 25.8	2.21	7.0
18	15 4.8	15 0.2	55 14.1	1.52	54 57.0	1.33	7 18.4	2.16	8.0
19	14 56.1	14 52.7	54 42.1	−1.14	54 29.6	−0.95	8 9.4	2.08	9.0
20	14 49.9	14 47.7	54 19.3	0.77	54 11.2	0.59	8 58.2	1.98	10.0
21	14 46.1	14 44.9	54 5.1	0.43	54 1.0	−0.26	9 44.5	1.86	11.0
22	14 44.3	14 44.2	53 58.8	−0.11	53 58.3	+0.03	10 28.4	1.79	12.0
23	14 44.5	14 45.2	53 59.4	+0.16	54 2.0	0.28	11 10.5	1.73	13.0
24	14 46.3	14 47.8	54 6.1	0.39	54 11.4	0.49	11 51.4	1.69	14.0
25	14 49.5	14 51.6	54 17.9	+0.59	54 25.5	+0.68	12 31.8	1.70	15.0
26	14 54.0	14 56.7	54 34.3	0.78	54 44.1	0.86	13 12.8	1.73	16.0
27	14 59.6	15 2.9	54 54.9	0.95	55 6.8	1.04	13 55.1	1.81	17.0
28	15 6.4	15 10.2	55 19.8	+1.13	55 33.8	+1.21	14 39.8	1.93	18.0
29	15 14.3	15 18.7	55 48.8	1.30	56 5.0	1.39	15 27.6	2.07	19.0
30	15 23.4	15 28.4	56 22.3	1.48	56 40.6	1.57	16 19.1	2.22	20.0
31	15 33.7	15 39.2	56 59.9	1.65	57 20.2	1.72	17 14.4	2.36	21.0
32	15 44.9	15 50.8	57 41.2	+1.78	58 2.8	+1.82	18 12.4	2.45	22.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 46 49.09	1.9801	S. 13 46 37.9	11.543
1	14 48 48.04	1.9850	13 58 9.0	11.493
2	14 50 47.29	1.9900	14 9 37.1	11.442
3	14 52 46.84	1.9950	14 21 2.1	11.390
4	14 54 46.69	2.0000	14 32 23.9	11.337
5	14 56 46.84	2.0051	14 43 42.5	11.282
6	14 58 47.30	2.0103	14 54 57.7	11.226
7	15 0 48.08	2.0156	15 6 9.6	11.170
8	15 2 49.18	2.0210	15 17 18.1	11.112
9	15 4 50.60	2.0263	15 28 23.1	11.054
10	15 6 52.34	2.0317	15 39 24.6	10.995
11	15 8 54.41	2.0373	15 50 22.5	10.934
12	15 10 56.82	2.0429	16 1 16.7	10.872
13	15 12 59.56	2.0485	16 12 7.1	10.809
14	15 15 2.64	2.0542	16 22 53.8	10.746
15	15 17 6.06	2.0598	16 33 36.6	10.680
16	15 19 9.82	2.0656	16 44 15.4	10.613
17	15 21 13.93	2.0714	16 54 50.2	10.546
18	15 23 18.39	2.0772	17 5 20.9	10.477
19	15 25 23.20	2.0832	17 15 47.4	10.408
20	15 27 28.37	2.0892	17 26 9.8	10.338
21	15 29 33.90	2.0952	17 36 28.0	10.267
22	15 31 39.79	2.1013	17 46 41.8	10.193
23	15 33 46.05	2.1074	S. 17 56 51.1	10.118

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 35 52.68	2.1136	S. 18 6 55.9	10.043
1	15 37 59.68	2.1197	18 16 56.2	9.967
2	15 40 7.05	2.1259	18 26 51.9	9.888
3	15 42 14.79	2.1322	18 36 42.8	9.808
4	15 44 22.91	2.1386	18 46 28.9	9.728
5	15 46 31.42	2.1450	18 56 10.2	9.647
6	15 48 40.31	2.1513	19 5 46.6	9.565
7	15 50 49.58	2.1577	19 15 18.0	9.481
8	15 52 59.24	2.1642	19 24 44.3	9.395
9	15 55 9.29	2.1707	19 34 5.4	9.308
10	15 57 19.73	2.1772	19 43 21.3	9.221
11	15 59 30.56	2.1838	19 52 31.9	9.132
12	16 1 41.79	2.1905	20 1 37.2	9.042
13	16 3 53.42	2.1971	20 10 37.0	8.950
14	16 6 5.44	2.2037	20 19 31.2	8.857
15	16 8 17.86	2.2104	20 28 19.8	8.763
16	16 10 30.69	2.2171	20 37 2.7	8.668
17	16 12 43.92	2.2238	20 45 39.9	8.571
18	16 14 57.55	2.2306	20 54 11.2	8.472
19	16 17 11.59	2.2373	21 2 36.6	8.373
20	16 19 26.03	2.2441	21 10 56.0	8.272
21	16 21 40.88	2.2509	21 19 9.3	8.170
22	16 23 56.14	2.2577	21 27 16.4	8.066
23	16 26 11.81	2.2645	21 35 17.2	7.961
24	16 28 27.88	2.2713	S. 21 43 11.7	7.855

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 28 27.88	2.2713	S. 21 43 11.7	7.855
1	16 30 44.36	2.2781	21 50 59.8	7.748
2	16 33 1.25	2.2850	21 58 41.5	7.640
3	16 35 18.56	2.2919	22 6 16.6	7.529
4	16 37 36.28	2.2987	22 13 45.0	7.417
5	16 39 54.41	2.3055	22 21 6.7	7.305
6	16 42 12.94	2.3123	22 28 21.6	7.191
7	16 44 31.88	2.3192	22 35 29.6	7.075
8	16 46 51.24	2.3260	22 42 30.6	6.958
9	16 49 11.00	2.3328	22 49 24.6	6.841
10	16 51 31.17	2.3396	22 56 11.5	6.721
11	16 53 51.75	2.3464	23 2 51.1	6.599
12	16 56 12.74	2.3532	23 9 23.4	6.477
13	16 58 34.13	2.3599	23 15 48.4	6.354
14	17 0 55.92	2.3666	23 22 5.9	6.228
15	17 3 18.12	2.3733	23 28 15.8	6.102
16	17 5 40.72	2.3799	23 34 18.1	5.975
17	17 8 3.71	2.3865	23 40 12.8	5.847
18	17 10 27.10	2.3931	23 45 59.7	5.716
19	17 12 50.88	2.3997	23 51 38.7	5.584
20	17 15 15.06	2.4062	23 57 9.8	5.452
21	17 17 39.63	2.4127	24 2 32.9	5.318
22	17 20 4.58	2.4191	24 7 47.9	5.182
23	17 22 29.92	2.4255	S. 24 12 54.7	5.044

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 24 55.64	2.4318	S. 24 17 53.2	4.906
1	17 27 21.74	2.4381	24 22 43.4	4.767
2	17 29 48.21	2.4443	24 27 25.2	4.627
3	17 32 15.06	2.4506	24 31 58.6	4.465
4	17 34 42.28	2.4567	24 36 23.4	4.341
5	17 37 9.86	2.4627	24 40 39.5	4.196
6	17 39 37.80	2.4687	24 44 46.9	4.050
7	17 42 6.10	2.4746	24 48 45.5	3.903
8	17 44 34.75	2.4805	24 52 35.3	3.756
9	17 47 3.76	2.4863	24 56 16.2	3.607
10	17 49 33.11	2.4920	24 59 48.1	3.456
11	17 52 2.80	2.4976	25 3 10.9	3.304
12	17 54 32.82	2.5031	25 6 24.6	3.152
13	17 57 3.17	2.5086	25 9 29.1	2.998
14	17 59 33.85	2.5140	25 12 24.3	2.842
15	18 2 4.85	2.5193	25 15 10.1	2.685
16	18 4 36.16	2.5245	25 17 46.5	2.528
17	18 7 7.79	2.5297	25 20 13.5	2.370
18	18 9 39.72	2.5346	25 22 30.9	2.210
19	18 12 11.94	2.5395	25 24 38.7	2.050
20	18 14 44.46	2.5443	25 26 36.9	1.889
21	18 17 17.26	2.5490	25 28 25.4	1.727
22	18 19 50.34	2.5537	25 30 4.1	1.563
23	18 22 23.70	2.5582	25 31 32.9	1.398
24	18 24 57.32	2.5625	S. 25 32 51.8	1.233

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 24 57.32	2.5625	S.25 32 51.8	1.233
1	18 27 31.20	2.5668	25 34 0.8	1.067
2	18 30 5.34	2.5710	25 34 59.8	0.900
3	18 32 39.72	2.5750	25 35 48.8	0.732
4	18 35 14.34	2.5789	25 36 27.7	0.563
5	18 37 49.19	2.5827	25 36 56.4	0.393
6	18 40 24.27	2.5865	25 37 14.9	0.223
7	18 42 59.57	2.5901	25 37 23.2	− 0.052
8	18 45 35.08	2.5934	25 37 21.2	+ 0.119
9	18 48 10.78	2.5967	25 37 8.9	0.292
10	18 50 46.68	2.5999	25 36 46.2	0.465
11	18 53 22.77	2.6030	25 36 13.1	0.638
12	18 55 59.04	2.6059	25 35 29.6	0.812
13	18 58 35.48	2.6087	25 34 35.6	0.987
14	19 1 12.09	2.6114	25 33 31.1	1.162
15	19 3 48.85	2.6139	25 32 16.1	1.338
16	19 6 25.76	2.6163	25 30 50.5	1.514
17	19 9 2.81	2.6186	25 29 14.4	1.690
18	19 11 39.99	2.6207	25 27 27.7	1.867
19	19 14 17.30	2.6227	25 25 30.3	2.045
20	19 16 54.72	2.6246	25 23 22.3	2.223
21	19 19 32.25	2.6263	25 21 3.6	2.401
22	19 22 9.88	2.6279	25 18 34.2	2.579
23	19 24 47.60	2.6293	S.25 15 54.1	2.757

FRIDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 27 25.40	2.6306	S.25 13 3.4	2.936
1	19 30 3.27	2.6317	25 10 1.9	3.114
2	19 32 41.21	2.6328	25 6 49.7	3.293
3	19 35 19.21	2.6337	25 3 26.8	3.472
4	19 37 57.26	2.6345	24 59 53.1	3.651
5	19 40 35.35	2.6351	24 56 8.7	3.829
6	19 43 13.47	2.6356	24 52 13.6	4.007
7	19 45 51.62	2.6359	24 48 7.8	4.186
8	19 48 29.78	2.6360	24 43 51.3	4.365
9	19 51 7.94	2.6360	24 39 24.0	4.543
10	19 53 46.10	2.6360	24 34 46.1	4.721
11	19 56 24.26	2.6358	24 29 57.5	4.899
12	19 59 2.40	2.6355	24 24 58.2	5.077
13	20 1 40.52	2.6350	24 19 48.3	5.254
14	20 4 18.60	2.6344	24 14 27.7	5.431
15	20 6 56.64	2.6337	24 8 56.5	5.607
16	20 9 34.64	2.6328	24 3 14.8	5.783
17	20 12 12.58	2.6317	23 57 22.5	5.959
18	20 14 50.45	2.6306	23 51 19.7	6.134
19	20 17 28.25	2.6294	23 45 6.4	6.308
20	20 20 5.98	2.6281	23 38 42.7	6.483
21	20 22 43.62	2.6266	23 32 8.5	6.657
22	20 25 21.17	2.6250	23 25 23.9	6.829
23	20 27 58.62	2.6232	23 18 29.0	7.000
24	20 30 35.96	2.6213	S.23 11 23.9	7.171

SATURDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 30 35.96	2.6213	S.23 11 23.9	7.171
1	20 33 13.18	2.6193	23 4 8.5	7.342
2	20 35 50.28	2.6173	22 56 42.9	7.512
3	20 38 27.26	2.6152	22 49 7.1	7.680
4	20 41 4.11	2.6130	22 41 21.3	7.848
5	20 43 40.82	2.6106	22 33 25.4	8.015
6	20 46 17.38	2.6081	22 25 19.5	8.181
7	20 48 53.79	2.6056	22 17 3.7	8.346
8	20 51 30.04	2.6028	22 8 38.0	8.509
9	20 54 6.12	2.5999	22 0 2.6	8.672
10	20 56 42.03	2.5971	21 51 17.4	8.834
11	20 59 17.77	2.5942	21 42 22.5	8.995
12	21 1 53.33	2.5911	21 33 18.0	9.154
13	21 4 28.70	2.5879	21 24 4.0	9.312
14	21 7 3.88	2.5846	21 14 40.5	9.469
15	21 9 38.86	2.5813	21 5 7.7	9.624
16	21 12 13.64	2.5780	20 55 25.6	9.779
17	21 14 48.22	2.5745	20 45 34.2	9.932
18	21 17 22.58	2.5709	20 35 33.7	10.084
19	21 19 56.73	2.5673	20 25 24.1	10.235
20	21 22 30.66	2.5637	20 15 5.5	10.383
21	21 25 4.38	2.5601	20 4 38.1	10.530
22	21 27 37.87	2.5562	19 54 1.9	10.677
23	21 30 11.12	2.5523	S.19 43 16.9	10.822

SUNDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 32 44.14	2.5484	S.19 32 23.2	10.966
1	21 35 16.93	2.5444	19 21 21.0	11.107
2	21 37 49.47	2.5403	19 10 10.4	11.246
3	21 40 21.77	2.5363	18 58 51.5	11.384
4	21 42 53.83	2.5323	18 47 24.3	11.522
5	21 45 25.64	2.5282	18 35 48.9	11.657
6	21 47 57.21	2.5240	18 24 5.5	11.790
7	21 50 28.52	2.5197	18 12 14.1	11.922
8	21 52 59.58	2.5155	18 0 14.9	12.051
9	21 55 30.38	2.5112	17 48 8.0	12.179
10	21 58 0.92	2.5068	17 35 53.4	12.306
11	22 0 31.20	2.5025	17 23 31.3	12.431
12	22 3 1.22	2.4981	17 11 1.7	12.554
13	22 5 30.97	2.4937	16 58 24.8	12.675
14	22 8 0.46	2.4893	16 45 40.7	12.794
15	22 10 29.69	2.4849	16 32 49.5	12.912
16	22 12 58.65	2.4805	16 19 51.3	13.028
17	22 15 27.35	2.4761	16 6 46.2	13.142
18	22 17 55.78	2.4716	15 53 34.3	13.253
19	22 20 23.94	2.4672	15 40 15.8	13.363
20	22 22 51.84	2.4627	15 26 50.7	13.472
21	22 25 19.46	2.4581	15 13 19.2	13.578
22	22 27 46.81	2.4537	14 59 41.4	13.682
23	22 30 13.90	2.4492	14 45 57.4	13.784
24	22 32 40.72	2.4447	S.14 32 7.3	13.884

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 32 40.72	2.4447	S. 14 32 7.3	13.884	0	0 25 25.48	2.2701	S. 2 8 52.2	16.297
1	22 35 7.27	2.4403	14 18 11.3	13.982	1	0 27 41.61	2.2678	1 52 34.3	16.298
2	22 37 33.56	2.4359	14 4 9.4	14.079	2	0 29 57.61	2.2655	1 36 16.4	16.297
3	22 39 59.58	2.4315	13 50 1.8	14.173	3	0 32 13.47	2.2632	1 19 58.6	16.294
4	22 42 25.34	2.4271	13 35 48.6	14.266	4	0 34 29.20	2.2611	1 3 41.1	16.289
5	22 44 50.83	2.4227	13 21 29.9	14.356	5	0 36 44.80	2.2590	0 47 23.9	16.282
6	22 47 16.06	2.4183	13 7 5.9	14.443	6	0 39 0.28	2.2570	0 31 7.2	16.273
7	22 49 41.03	2.4140	12 52 36.7	14.530	7	0 41 15.64	2.2550	S. 0 14 51.1	16.263
8	22 52 5.74	2.4096	12 38 2.3	14.615	8	0 43 30.88	2.2530	N. 0 1 24.4	16.252
9	22 54 30.18	2.4053	12 23 22.9	14.697	9	0 45 46.00	2.2512	0 17 39.1	16.238
10	22 56 54.37	2.4010	12 8 38.6	14.777	10	0 48 1.02	2.2495	0 33 52.9	16.222
11	22 59 18.30	2.3967	11 53 49.6	14.855	11	0 50 15.94	2.2477	0 50 5.7	16.203
12	23 1 41.97	2.3924	11 38 56.0	14.931	12	0 52 30.75	2.2460	1 6 17.3	16.183
13	23 4 5.39	2.3882	11 23 57.9	15.005	13	0 54 45.46	2.2444	1 22 27.7	16.162
14	23 6 28.56	2.3842	11 8 55.4	15.077	14	0 57 0.08	2.2430	1 38 36.8	16.139
15	23 8 51.49	2.3801	10 53 48.7	15.147	15	0 59 14.62	2.2416	1 54 44.4	16.114
16	23 11 14.17	2.3759	10 38 37.8	15.215	16	1 1 29.07	2.2402	2 10 50.5	16.087
17	23 13 36.60	2.3718	10 23 22.9	15.280	17	1 3 43.44	2.2388	2 26 54.9	16.059
18	23 15 58.78	2.3677	10 8 4.2	15.343	18	1 5 57.72	2.2374	2 42 57.6	16.029
19	23 18 20.72	2.3637	9 52 41.7	15.405	19	1 8 11.93	2.2363	2 58 58.4	15.997
20	23 20 42.43	2.3598	9 37 15.6	15.465	20	1 10 26.07	2.2352	3 14 57.3	15.964
21	23 23 3.90	2.3559	9 21 45.9	15.522	21	1 12 40.15	2.2342	3 30 54.1	15.928
22	23 25 25.14	2.3521	9 6 12.9	15.577	22	1 14 54.17	2.2331	3 46 48.7	15.891
23	23 27 46.15	2.3483	S. 8 50 36.6	15.631	23	1 17 8.12	2.2320	N. 4 2 41.0	15.852
	TUESDAY 10.					THURSDAY 12.			
0	23 30 6.93	2.3445	S. 8 34 57.2	15.682	0	1 19 22.01	2.2311	N. 4 18 31.0	15.812
1	23 32 27.49	2.3407	8 19 14.8	15.731	1	1 21 35.85	2.2303	4 34 18.5	15.770
2	23 34 47.82	2.3370	8 3 29.5	15.777	2	1 23 49.65	2.2296	4 50 3.4	15.727
3	23 37 7.93	2.3334	7 47 41.5	15.822	3	1 26 3.40	2.2289	5 5 45.7	15.682
4	23 39 27.83	2.3299	7 31 50.8	15.866	4	1 28 17.11	2.2283	5 21 25.2	15.635
5	23 41 47.52	2.3263	7 15 57.6	15.907	5	1 30 30.78	2.2276	5 37 1.9	15.587
6	23 44 6.99	2.3228	7 0 2.0	15.946	6	1 32 44.42	2.2271	5 52 35.7	15.537
7	23 46 26.26	2.3195	6 44 4.1	15.982	7	1 34 58.03	2.2266	6 8 6.4	15.486
8	23 48 45.33	2.3162	6 28 4.1	16.017	8	1 37 11.61	2.2261	6 23 34.0	15.432
9	23 51 4.20	2.3128	6 12 2.1	16.049	9	1 39 25.16	2.2257	6 38 58.3	15.377
10	23 53 22.87	2.3095	5 55 58.2	16.080	10	1 41 38.69	2.2254	6 54 19.3	15.322
11	23 55 41.34	2.3063	5 39 52.5	16.108	11	1 43 52.21	2.2252	7 9 37.0	15.265
12	23 57 59.62	2.3032	5 23 45.2	16.134	12	1 46 5.71	2.2249	7 24 51.1	15.205
13	0 0 17.72	2.3002	5 7 36.4	16.159	13	1 48 19.20	2.2248	7 40 1.6	15.145
14	0 2 35.64	2.2972	4 51 26.1	16.182	14	1 50 32.69	2.2247	7 55 8.5	15.083
15	0 4 53.38	2.2942	4 35 14.5	16.202	15	1 52 46.17	2.2247	8 10 11.6	15.019
16	0 7 10.94	2.2912	4 19 1.8	16.221	16	1 54 59.65	2.2247	8 25 10.8	14.954
17	0 9 28.32	2.2883	4 2 48.0	16.237	17	1 57 13.13	2.2247	8 40 6.1	14.888
18	0 11 45.53	2.2855	3 46 33.3	16.252	18	1 59 26.62	2.2248	8 54 57.4	14.821
19	0 14 2.58	2.2828	3 30 17.8	16.264	19	2 1 40.11	2.2249	9 9 44.6	14.752
20	0 16 19.47	2.2801	3 14 1.6	16.275	20	2 3 53.61	2.2252	9 24 27.6	14.681
21	0 18 36.20	2.2775	2 57 44.8	16.283	21	2 6 7.13	2.2255	9 39 6.3	14.609
22	0 20 52.77	2.2750	2 41 27.6	16.290	22	2 8 20.67	2.2258	9 53 40.7	14.537
23	0 23 9.20	2.2726	2 25 10.0	16.295	23	2 10 34.23	2.2262	10 8 10.7	14.462
24	0 25 25.48	2.2701	S. 2 8 52.2	16.297	24	2 12 47.81	2.2266	N. 10 22 36.1	14.386

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.					**SUNDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 12 47.81	2.2266	N.10 22 36.1	14.386	0	4 0 45.34	2.2789	N.20 4 6.5	9.470
1	2 15 1.42	2.2270	10 36 57.0	14.309	1	4 3 2.11	2.2802	20 13 31.0	9.347
2	2 17 15.05	2.2274	10 51 13.2	14.231	2	4 5 18.96	2.2815	20 22 48.1	9.223
3	2 19 28.71	2.2279	11 5 24.7	14.152	3	4 7 35.89	2.2827	20 31 57.8	9.099
4	2 21 42.40	2.2285	11 19 31.4	14.071	4	4 9 52.89	2.2840	20 41 0.0	8.973
5	2 23 56.13	2.2292	11 33 33.2	13.987	5	4 12 9.97	2.2852	20 49 54.6	8.847
6	2 26 9.90	2.2298	11 47 29.9	13.903	6	4 14 27.12	2.2864	20 58 41.7	8.721
7	2 28 23.71	2.2305	12 1 21.6	13.819	7	4 16 44.34	2.2876	21 7 21.2	8.594
8	2 30 37.56	2.2313	12 15 8.2	13.733	8	4 19 1.63	2.2888	21 15 53.0	8.467
9	2 32 51.46	2.2321	12 28 49.6	13.647	9	4 21 19.00	2.2900	21 24 17.2	8.339
10	2 35 5.41	2.2329	12 42 25.8	13.559	10	4 23 36.43	2.2910	21 32 33.7	8.210
11	2 37 19.41	2.2337	12 55 56.7	13.470	11	4 25 53.92	2.2921	21 40 42.4	8.081
12	2 39 33.45	2.2345	13 9 22.2	13.379	12	4 28 11.48	2.2932	21 48 43.4	7.952
13	2 41 47.55	2.2355	13 22 42.2	13.287	13	4 30 29.10	2.2942	21 56 36.6	7.822
14	2 44 1.71	2.2364	13 35 56.7	13.194	14	4 32 46.78	2.2952	22 4 22.0	7.692
15	2 46 15.92	2.2373	13 49 5.5	13.100	15	4 35 4.53	2.2962	22 11 59.6	7.561
16	2 48 30.19	2.2383	14 2 8.7	13.006	16	4 37 22.33	2.2972	22 19 29.3	7.429
17	2 50 44.52	2.2394	14 15 6.2	12.909	17	4 39 40.19	2.2982	22 26 51.1	7.298
18	2 52 58.92	2.2405	14 27 57.8	12.812	18	4 41 58.11	2.2991	22 34 5.1	7.166
19	2 55 13.38	2.2416	14 40 43.6	12.714	19	4 44 16.08	2.2999	22 41 11.1	7.033
20	2 57 27.91	2.2427	14 53 23.5	12.615	20	4 46 34.09	2.3006	22 48 9.1	6.901
21	2 59 42.50	2.2438	15 5 57.4	12.515	21	4 48 52.15	2.3013	22 54 59.2	6.768
22	3 1 57.16	2.2449	15 18 25.3	12.413	22	4 51 10.25	2.3021	23 1 41.3	6.634
23	3 4 11.89	2.2462	N.15 30 47.0	12.310	23	4 53 28.40	2.3028	N.23 8 15.3	6.500

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 14.					**MONDAY 16.**			
0	3 6 26.70	2.2474	N.15 43 2.5	12.207	0	4 55 46.59	2.3034	N.23 14 41.3	6.366
1	3 8 41.58	2.2486	15 55 11.8	12.103	1	4 58 4.81	2.3040	23 20 59.2	6.232
2	3 10 56.53	2.2498	16 7 14.9	11.998	2	5 0 23.07	2.3046	23 27 9.1	6.097
3	3 13 11.55	2.2510	16 19 11.6	11.892	3	5 2 41.36	2.3051	23 33 10.9	5.962
4	3 15 26.65	2.2523	16 31 1.9	11.785	4	5 4 59.68	2.3056	23 39 4.6	5.827
5	3 17 41.83	2.2536	16 42 45.8	11.678	5	5 7 18.03	2.3060	23 44 50.2	5.692
6	3 19 57.08	2.2549	16 54 23.3	11.570	6	5 9 36.40	2.3063	23 50 27.6	5.556
7	3 22 12.41	2.2562	17 5 54.2	11.459	7	5 11 54.79	2.3067	23 55 56.9	5.420
8	3 24 27.83	2.2576	17 17 18.4	11.348	8	5 14 13.20	2.3070	24 1 18.0	5.284
9	3 26 43.32	2.2589	17 28 35.9	11.236	9	5 16 31.63	2.3072	24 6 31.0	5.148
10	3 28 58.89	2.2602	17 39 46.7	11.124	10	5 18 50.07	2.3074	24 11 35.8	5.011
11	3 31 14.54	2.2615	17 50 50.8	11.011	11	5 21 8.52	2.3075	24 16 32.3	4.874
12	3 33 30.27	2.2628	18 1 48.0	10.897	12	5 23 26.97	2.3076	24 21 20.7	4.738
13	3 35 46.08	2.2642	18 12 38.4	10.782	13	5 25 45.43	2.3077	24 26 0.9	4.601
14	3 38 1.97	2.2655	18 23 21.9	10.667	14	5 28 3.89	2.3076	24 30 32.9	4.464
15	3 40 17.94	2.2669	18 33 58.4	10.550	15	5 30 22.34	2.3075	24 34 56.6	4.327
16	3 42 34.00	2.2683	18 44 27.9	10.433	16	5 32 40.79	2.3073	24 39 12.1	4.191
17	3 44 50.14	2.2697	18 54 50.4	10.315	17	5 34 59.22	2.3071	24 43 19.5	4.054
18	3 47 6.36	2.2710	19 5 5.7	10.196	18	5 37 17.64	2.3068	24 47 18.6	3.917
19	3 49 22.66	2.2723	19 15 13.9	10.077	19	5 39 36.04	2.3065	24 51 9.5	3.779
20	3 51 39.04	2.2736	19 25 14.9	9.957	20	5 41 54.42	2.3062	24 54 52.1	3.642
21	3 53 55.49	2.2749	19 35 8.8	9.837	21	5 44 12.78	2.3057	24 58 26.5	3.505
22	3 56 12.03	2.2763	19 44 55.4	9.715	22	5 46 31.11	2.3052	25 1 52.7	3.368
23	3 58 28.65	2.2776	19 54 34.6	9.592	23	5 48 49.41	2.3047	25 5 10.7	3.231
24	4 0 45.34	2.2789	N.20 4 6.5	9.470	24	5 51 7.68	2.3042	N.25 8 20.4	3.094

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 51 7.68	2.3042	N.25 8 20.4	3.094	0	7 39 52.80	2.2054	N.25 2 46.1	3.188
1	5 53 25.91	2.3035	25 11 21.9	2.957	1	7 42 5.03	2.2021	24 59 31.2	3.308
2	5 55 44.10	2.3027	25 14 15.2	2.820	2	7 44 17.06	2.1987	24 56 9.1	3.428
3	5 58 2.24	2.3019	25 17 0.3	2.682	3	7 46 28.88	2.1953	24 52 39.8	3.547
4	6 0 20.33	2.3011	25 19 37.1	2.545	4	7 48 40.50	2.1919	24 49 3.4	3.665
5	6 2 38.37	2.3002	25 22 5.7	2.408	5	7 50 51.91	2.1885	24 45 20.0	3.783
6	6 4 56.35	2.2992	25 24 26.1	2.272	6	7 53 3.12	2.1850	24 41 29.5	3.900
7	6 7 14.27	2.2982	25 26 38.3	2.135	7	7 55 14.11	2.1814	24 37 32.0	4.016
8	6 9 32.13	2.2971	25 28 42.3	1.999	8	7 57 24.89	2.1778	24 33 27.6	4.131
9	6 11 49.92	2.2959	25 30 38.2	1.863	9	7 59 35.45	2.1743	24 29 16.3	4.246
10	6 14 7.64	2.2946	25 32 25.9	1.727	10	8 1 45.80	2.1707	24 24 58.1	4.360
11	6 16 25.28	2.2933	25 34 5.5	1.592	11	8 3 55.93	2.1670	24 20 33.1	4.474
12	6 18 42.84	2.2920	25 35 36.9	1.456	12	8 6 5.84	2.1633	24 16 1.2	4.587
13	6 21 0.32	2.2906	25 37 0.2	1.321	13	8 8 15.53	2.1596	24 11 22.6	4.699
14	6 23 17.71	2.2891	25 38 15.4	1.185	14	8 10 24.99	2.1558	24 6 37.3	4.811
15	6 25 35.01	2.2876	25 39 22.4	1.050	15	8 12 34.23	2.1521	24 1 45.3	4.922
16	6 27 52.22	2.2861	25 40 21.4	0.916	16	8 14 43.24	2.1483	23 56 46.6	5.032
17	6 30 9.34	2.2845	25 41 12.3	0.782	17	8 16 52.02	2.1445	23 51 41.4	5.142
18	6 32 26.36	2.2827	25 41 55.2	0.647	18	8 19 0.58	2.1407	23 46 29.6	5.251
19	6 34 43.27	2.2809	25 42 30.0	0.513	19	8 21 8.91	2.1368	23 41 11.3	5.359
20	6 37 0.07	2.2791	25 42 56.8	0.380	20	8 23 17.00	2.1329	23 35 46.5	5.467
21	6 39 16.76	2.2772	25 43 15.6	0.247	21	8 25 24.86	2.1291	23 30 15.3	5.573
22	6 41 33.34	2.2753	25 43 26.4	+ 0.114	22	8 27 32.49	2.1252	23 24 37.7	5.679
23	6 43 49.80	2.2733	N.25 43 29.3	− 0.019	23	8 29 39.88	2.1212	N.23 18 53.8	5.784
	WEDNESDAY 18.					**FRIDAY 20.**			
0	6 46 6.13	2.2712	N.25 43 24.2	0.151	0	8 31 47.04	2.1173	N.23 13 3.6	5.889
1	6 48 22.34	2.2691	25 43 11.2	0.282	1	8 33 53.96	2.1133	23 7 7.1	5.993
2	6 50 38.42	2.2668	25 42 50.3	0.413	2	8 36 0.64	2.1094	23 1 4.4	6.096
3	6 52 54.36	2.2646	25 42 21.6	0.544	3	8 38 7.09	2.1055	22 54 55.6	6.199
4	6 55 10.17	2.2623	25 41 45.0	0.675	4	8 40 13.30	2.1015	22 48 40.6	6.301
5	6 57 25.84	2.2600	25 41 0.6	0.806	5	8 42 19.27	2.0976	22 42 19.5	6.402
6	6 59 41.37	2.2576	25 40 8.3	0.936	6	8 44 25.01	2.0936	22 35 52.4	6.502
7	7 1 56.75	2.2551	25 39 8.3	1.065	7	8 46 30.51	2.0896	22 29 19.3	6.601
8	7 4 11.98	2.2526	25 38 0.5	1.194	8	8 48 35.76	2.0855	22 22 40.3	6.700
9	7 6 27.06	2.2500	25 36 45.0	1.322	9	8 50 40.77	2.0815	22 15 55.3	6.799
10	7 8 41.98	2.2473	25 35 21.8	1.450	10	8 52 45.54	2.0775	22 9 4.4	6.896
11	7 10 56.74	2.2446	25 33 51.0	1.577	11	8 54 50.07	2.0736	22 2 7.8	6.992
12	7 13 11.34	2.2419	25 32 12.5	1.705	12	8 56 54.37	2.0697	21 55 5.4	7.088
13	7 15 25.77	2.2391	25 30 26.4	1.832	13	8 58 58.43	2.0656	21 47 57.3	7.183
14	7 17 40.03	2.2362	25 28 32.7	1.958	14	9 1 2.24	2.0615	21 40 43.5	7.278
15	7 19 54.12	2.2334	25 26 31.5	2.083	15	9 3 5.81	2.0575	21 33 24.0	7.372
16	7 22 8.04	2.2306	25 24 22.8	2.208	16	9 5 9.14	2.0535	21 25 58.9	7.464
17	7 24 21.79	2.2277	25 22 6.6	2.333	17	9 7 12.23	2.0496	21 18 28.3	7.555
18	7 26 35.36	2.2246	25 19 42.9	2.457	18	9 9 15.09	2.0456	21 10 52.3	7.646
19	7 28 48.74	2.2214	25 17 11.8	2.580	19	9 11 17.70	2.0415	21 3 10.8	7.737
20	7 31 1.93	2.2183	25 14 33.3	2.703	20	9 13 20.07	2.0376	20 55 23.9	7.827
21	7 33 14.94	2.2152	25 11 47.4	2.826	21	9 15 22.21	2.0337	20 47 31.6	7.916
22	7 35 27.76	2.2120	25 8 54.2	2.947	22	9 17 24.11	2.0297	20 39 34.0	8.004
23	7 37 40.38	2.2087	25 5 53.8	3.068	23	9 19 25.77	2.0257	20 31 31.1	8.092
24	7 39 52.80	2.2054	N.25 2 46.1	3.188	24	9 21 27.20	2.0218	N.20 23 23.0	8.178

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 21 27.20	2.0218	N.20 23 23.0	8.178
1	9 23 28.39	2.0179	20 15 9.7	8.264
2	9 25 29.35	2.0140	20 6 51.3	8.349
3	9 27 30.07	2.0101	19 58 27.8	8.433
4	9 29 30.56	2.0062	19 49 59.3	8.517
5	9 31 30.82	2.0023	19 41 25.8	8.600
6	9 33 30.84	1.9984	19 32 47.3	8.682
7	9 35 30.63	1.9946	19 24 3.9	8.763
8	9 37 30.20	1.9909	19 15 15.7	8.843
9	9 39 29.54	1.9871	19 6 22.7	8.923
10	9 41 28.65	1.9834	18 57 24.9	9.002
11	9 43 27.54	1.9797	18 48 22.4	9.081
12	9 45 26.21	1.9760	18 39 15.2	9.158
13	9 47 24.66	1.9722	18 30 3.4	9.235
14	9 49 22.88	1.9685	18 20 47.0	9.311
15	9 51 20.88	1.9648	18 11 26.1	9.386
16	9 53 18.66	1.9612	18 2 0.7	9.460
17	9 55 16.23	1.9577	17 52 30.9	9.534
18	9 57 13.58	1.9541	17 42 56.6	9.607
19	9 59 10.72	1.9506	17 33 18.0	9.679
20	10 1 7.65	1.9471	17 23 35.1	9.751
21	10 3 4.37	1.9436	17 13 47.9	9.822
22	10 5 0.88	1.9401	17 3 56.5	9.891
23	10 6 57.18	1.9367	N.16 54 1.0	9.960

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 8 53.28	1.9333	N.16 44 1.3	10.029
1	10 10 49.18	1.9300	16 33 57.5	10.096
2	10 12 44.88	1.9267	16 23 49.7	10.162
3	10 14 40.38	1.9234	16 13 38.0	10.228
4	10 16 35.68	1.9201	16 3 22.3	10.294
5	10 18 30.79	1.9168	15 53 2.7	10.358
6	10 20 25.70	1.9137	15 42 39.3	10.422
7	10 22 20.43	1.9106	15 32 12.1	10.486
8	10 24 14.97	1.9074	15 21 41.1	10.547
9	10 26 9.32	1.9043	15 11 6.4	10.609
10	10 28 3.49	1.9013	15 0 28.0	10.670
11	10 29 57.48	1.8983	14 49 46.0	10.730
12	10 31 51.28	1.8953	14 39 0.4	10.789
13	10 33 44.90	1.8924	14 28 11.3	10.847
14	10 35 38.36	1.8896	14 17 18.7	10.905
15	10 37 31.65	1.8867	14 6 22.7	10.962
16	10 39 24.77	1.8839	13 55 23.3	11.018
17	10 41 17.72	1.8811	13 44 20.5	11.074
18	10 43 10.50	1.8784	13 33 14.4	11.128
19	10 45 3.12	1.8757	13 22 5.1	11.182
20	10 46 55.58	1.8730	13 10 52.5	11.236
21	10 48 47.88	1.8704	12 59 36.7	11.289
22	10 50 40.03	1.8679	12 48 17.8	11.340
23	10 52 32.03	1.8653	12 36 55.9	11.391
24	10 54 23.87	1.8628	N.12 25 30.9	11.442

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 54 23.87	1.8628	N.12 25 30.9	11.442
1	10 56 15.57	1.8605	12 14 2.9	11.491
2	10 58 7.13	1.8581	12 2 32.0	11.540
3	10 59 58.54	1.8558	11 50 58.1	11.589
4	11 1 49.82	1.8535	11 39 21.3	11.636
5	11 3 40.96	1.8513	11 27 41.8	11.682
6	11 5 31.97	1.8491	11 15 59.5	11.728
7	11 7 22.85	1.8469	11 4 14.5	11.773
8	11 9 13.60	1.8448	10 52 26.8	11.818
9	11 11 4.23	1.8427	10 40 36.4	11.862
10	11 12 54.73	1.8407	10 28 43.4	11.904
11	11 14 45.12	1.8388	10 16 47.9	11.946
12	11 16 35.39	1.8369	10 4 49.9	11.987
13	11 18 25.55	1.8351	9 52 49.4	12.028
14	11 20 15.60	1.8332	9 40 46.5	12.068
15	11 22 5.54	1.8314	9 28 41.3	12.107
16	11 23 55.37	1.8298	9 16 33.7	12.146
17	11 25 45.11	1.8282	9 4 23.8	12.184
18	11 27 34.75	1.8265	8 52 11.6	12.222
19	11 29 24.29	1.8249	8 39 57.2	12.258
20	11 31 13.74	1.8234	8 27 40.7	12.293
21	11 33 3.10	1.8220	8 15 22.1	12.328
22	11 34 52.38	1.8206	8 3 1.4	12.362
23	11 36 41.57	1.8192	N. 7 50 38.7	12.395

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 38 30.68	1.8179	N. 7 38 14.0	12.427
1	11 40 19.72	1.8166	7 25 47.4	12.459
2	11 42 8.68	1.8154	7 13 18.9	12.491
3	11 43 57.57	1.8143	7 0 48.5	12.522
4	11 45 46.40	1.8132	6 48 16.3	12.551
5	11 47 35.16	1.8122	6 35 42.4	12.580
6	11 49 23.86	1.8112	6 23 6.7	12.608
7	11 51 12.50	1.8103	6 10 29.4	12.635
8	11 53 1.09	1.8094	5 57 50.5	12.662
9	11 54 49.63	1.8086	5 45 9.9	12.689
10	11 56 38.12	1.8078	5 32 27.8	12.714
11	11 58 26.57	1.8071	5 19 44.2	12.738
12	12 0 14.98	1.8065	5 6 59.2	12.762
13	12 2 3.35	1.8059	4 54 12.8	12.785
14	12 3 51.69	1.8053	4 41 25.0	12.807
15	12 5 39.99	1.8047	4 28 35.9	12.829
16	12 7 28.26	1.8043	4 15 45.5	12.850
17	12 9 16.51	1.8040	4 2 53.9	12.870
18	12 11 4.74	1.8037	3 50 1.1	12.889
19	12 12 52.95	1.8034	3 37 7.2	12.908
20	12 14 41.15	1.8032	3 24 12.2	12.926
21	12 16 29.33	1.8030	3 11 16.1	12.943
22	12 18 17.51	1.8030	2 58 19.0	12.959
23	12 20 5.69	1.8029	2 45 21.0	12.975
24	12 21 53.86	1.8029	N. 2 32 22.0	12.991

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 21 53.86	1.8029	N. 2 32 22.0	12.991
1	12 23 42.04	1.8030	2 19 22.1	13.005
2	12 25 30.22	1.8031	2 6 21.4	13.018
3	12 27 18.41	1.8033	1 53 20.0	13.030
4	12 29 6.61	1.8035	1 40 17.8	13.042
5	12 30 54.83	1.8038	1 27 14.9	13.053
6	12 32 43.07	1.8042	1 14 11.4	13.063
7	12 34 31.33	1.8046	1 1 7.3	13.073
8	12 36 19.62	1.8051	0 48 2.6	13.082
9	12 38 7.94	1.8056	0 34 57.4	13.090
10	12 39 56.29	1.8062	0 21 51.8	13.098
11	12 41 44.68	1.8068	N. 0 8 45.7	13.105
12	12 43 33.11	1.8075	S. 0 4 20.8	13.111
13	12 45 21.58	1.8083	0 17 27.6	13.115
14	12 47 10.10	1.8092	0 30 34.6	13.119
15	12 48 58.68	1.8101	0 43 41.9	13.123
16	12 50 47.31	1.8110	0 56 49.4	13.126
17	12 52 36.00	1.8120	1 9 57.0	13.128
18	12 54 24.75	1.8130	1 23 4.7	13.129
19	12 56 13.56	1.8141	1 36 12.5	13.129
20	12 58 2.44	1.8153	1 49 20.2	13.128
21	12 59 51.40	1.8166	2 2 27.9	13.127
22	13 1 40.43	1.8179	2 15 35.5	13.125
23	13 3 29.54	1.8193	S. 2 28 42.9	13.121

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 5 18.74	1.8208	S. 2 41 50.1	13.117
1	13 7 8.03	1.8222	2 54 57.0	13.113
2	13 8 57.40	1.8236	3 8 3.7	13.109
3	13 10 46.86	1.8252	3 21 10.1	13.103
4	13 12 36.42	1.8269	3 34 16.1	13.096
5	13 14 26.09	1.8287	3 47 21.6	13.089
6	13 16 15.86	1.8304	4 0 26.7	13.081
7	13 18 5.74	1.8322	4 13 31.3	13.071
8	13 19 55.73	1.8342	4 26 35.2	13.060
9	13 21 45.84	1.8362	4 39 38.5	13.049
10	13 23 36.07	1.8382	4 52 41.1	13.037
11	13 25 26.42	1.8402	5 5 43.0	13.025
12	13 27 16.89	1.8423	5 18 44.1	13.011
13	13 29 7.49	1.8445	5 31 44.3	12.997
14	13 30 58.23	1.8468	5 44 43.7	12.982
15	13 32 49.11	1.8492	5 57 42.2	12.967
16	13 34 40.13	1.8515	6 10 39.7	12.949
17	13 36 31.29	1.8539	6 23 36.1	12.931
18	13 38 22.60	1.8564	6 36 31.4	12.912
19	13 40 14.06	1.8590	6 49 25.6	12.893
20	13 42 5.68	1.8616	7 2 18.6	12.873
21	13 43 57.45	1.8642	7 15 10.4	12.852
22	13 45 49.38	1.8669	7 28 0.9	12.830
23	13 47 41.48	1.8698	7 40 50.0	12.807
24	13 49 33.76	1.8727	S. 7 53 37.7	12.783

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 49 33.76	1.8727	S. 7 53 37.7	12.783
1	13 51 26.21	1.8756	8 6 23.9	12.758
2	13 53 18.83	1.8785	8 19 8.7	12.733
3	13 55 11.63	1.8816	8 31 51.9	12.707
4	13 57 4.62	1.8847	8 44 33.5	12.679
5	13 58 57.80	1.8878	8 57 13.4	12.651
6	14 0 51.16	1.8910	9 9 51.6	12.622
7	14 2 44.72	1.8943	9 22 28.0	12.592
8	14 4 38.48	1.8977	9 35 2.6	12.560
9	14 6 32.44	1.9010	9 47 35.2	12.528
10	14 8 26.60	1.9044	10 0 5.9	12.495
11	14 10 20.97	1.9080	10 12 34.6	12.461
12	14 12 15.56	1.9116	10 25 1.2	12.426
13	14 14 10.36	1.9152	10 37 25.7	12.390
14	14 16 5.38	1.9188	10 49 48.0	12.353
15	14 18 0.62	1.9226	11 2 8.1	12.316
16	14 19 56.09	1.9264	11 14 25.9	12.277
17	14 21 51.79	1.9302	11 26 41.4	12.236
18	14 23 47.72	1.9341	11 38 54.5	12.197
19	14 25 43.88	1.9380	11 51 5.1	12.156
20	14 27 40.28	1.9421	12 3 13.2	12.113
21	14 29 36.93	1.9462	12 15 18.7	12.069
22	14 31 33.83	1.9504	12 27 21.5	12.025
23	14 33 30.98	1.9546	S. 12 39 21.7	11.980

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 35 28.38	1.9588	S. 12 51 19.1	11.933
1	14 37 26.04	1.9631	13 3 13.7	11.886
2	14 39 23.96	1.9674	13 15 5.4	11.837
3	14 41 22.13	1.9717	13 26 54.1	11.787
4	14 43 20.57	1.9762	13 38 39.8	11.737
5	14 45 19.28	1.9807	13 50 22.5	11.686
6	14 47 18.26	1.9853	14 2 2.1	11.633
7	14 49 17.52	1.9900	14 13 38.5	11.579
8	14 51 17.06	1.9947	14 25 11.6	11.524
9	14 53 16.88	1.9993	14 36 41.4	11.468
10	14 55 16.98	2.0040	14 48 7.8	11.412
11	14 57 17.36	2.0088	14 59 30.8	11.354
12	14 59 18.03	2.0137	15 10 50.3	11.295
13	15 1 19.00	2.0187	15 22 6.2	11.235
14	15 3 20.27	2.0236	15 33 18.5	11.174
15	15 5 21.83	2.0285	15 44 27.1	11.112
16	15 7 23.69	2.0336	15 55 31.9	11.048
17	15 9 25.86	2.0387	16 6 32.9	10.983
18	15 11 28.34	2.0439	16 17 29.9	10.918
19	15 13 31.13	2.0491	16 28 23.0	10.852
20	15 15 34.23	2.0543	16 39 12.1	10.784
21	15 17 37.64	2.0595	16 49 57.1	10.716
22	15 19 41.37	2.0648	17 0 38.0	10.646
23	15 21 45.42	2.0701	17 11 14.6	10.574
24	15 23 49.78	2.0754	S. 17 21 46.9	10.502

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 23 49.78	2.0754	S. 17 21 46.9	10.502
1	15 25 54.47	2.0809	17 32 14.9	10.429
2	15 27 59.49	2.0864	17 42 38.4	10.354
3	15 30 4.84	2.0919	17 52 57.4	10.279
4	15 32 10.52	2.0974	18 3 11.9	10.202
5	15 34 16.53	2.1029	18 13 21.7	10.123
6	15 36 22.87	2.1085	18 23 26.7	10.044
7	15 38 29.55	2.1142	18 33 27.0	9.965
8	15 40 36.57	2.1198	18 43 22.5	9.883
9	15 42 43.93	2.1255	18 53 13.0	9.800
10	15 44 51.63	2.1312	19 2 58.5	9.717
11	15 46 59.68	2.1370	19 12 39.0	9.632
12	15 49 8.07	2.1428	19 22 14.4	9.547
13	15 51 16.81	2.1486	19 31 44.7	9.460
14	15 53 25.90	2.1543	19 41 9.6	9.370
15	15 55 35.33	2.1601	19 50 29.1	9.280
16	15 57 45.11	2.1660	19 59 43.2	9.190
17	15 59 55.25	2.1719	20 8 51.9	9.098
18	16 2 5.74	2.1778	20 17 55.0	9.005
19	16 4 16.58	2.1837	20 26 52.5	8.911
20	16 6 27.78	2.1897	20 35 44.3	8.815
21	16 8 39.34	2.1956	20 44 30.3	8.718
22	16 10 51.25	2.2015	20 53 10.5	8.620
23	16 13 3.52	2.2074	S. 21 1 44.7	8.520

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 15 16.14	2.2133	S. 21 10 12.9	8.419
1	16 17 29.12	2.2194	21 18 35.0	8.318
2	16 19 42.47	2.2254	21 26 51.1	8.217
3	16 21 56.17	2.2313	21 35 1.0	8.113
4	16 24 10.23	2.2373	21 43 4.6	8.007
5	16 26 24.65	2.2432	21 51 1.8	7.900
6	16 28 39.42	2.2492	21 58 52.6	7.792
7	16 30 54.55	2.2552	22 6 36.9	7.684
8	16 33 10.05	2.2612	22 14 14.7	7.574
9	16 35 25.90	2.2672	22 21 45.8	7.463
10	16 37 42.11	2.2731	22 29 10.2	7.350
11	16 39 58.67	2.2790	22 36 27.8	7.236
12	16 42 15.59	2.2850	22 43 38.5	7.121
13	16 44 32.87	2.2909	22 50 42.3	7.005
14	16 46 50.50	2.2967	22 57 39.1	6.888
15	16 49 8.48	2.3026	23 4 28.9	6.770
16	16 51 26.81	2.3084	23 11 11.5	6.650
17	16 53 45.49	2.3143	23 17 46.9	6.529
18	16 56 4.53	2.3202	23 24 15.0	6.407
19	16 58 23.91	2.3259	23 30 35.7	6.283
20	17 0 43.64	2.3316	23 36 49.0	6.159
21	17 3 3.71	2.3373	23 42 54.8	6.034
22	17 5 24.12	2.3430	23 48 53.1	5.907
23	17 7 44.87	2.3487	23 54 43.7	5.779
24	17 10 5.96	2.3543	S. 24 0 26.6	5.650

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 10 5.96	2.3543	S. 24 0 26.6	5.650
1	17 12 27.38	2.3598	24 6 1.7	5.520
2	17 14 49.14	2.3654	24 11 29.0	5.389
3	17 17 11.23	2.3708	24 16 48.4	5.257
4	17 19 33.64	2.3762	24 21 59.8	5.123
5	17 21 56.38	2.3816	24 27 3.2	4.988
6	17 24 19.44	2.3870	24 31 58.4	4.852
7	17 26 42.82	2.3923	24 36 45.5	4.716
8	17 29 6.51	2.3975	24 41 24.3	4.578
9	17 31 30.52	2.4027	24 45 54.8	4.439
10	17 33 54.84	2.4078	24 50 17.0	4.300
11	17 36 19.46	2.4128	24 54 30.8	4.159
12	17 38 44.38	2.4178	24 58 36.1	4.017
13	17 41 9.60	2.4227	25 2 32.8	3.874
14	17 43 35.11	2.4276	25 6 20.9	3.730
15	17 46 0.91	2.4324	25 10 0.4	3.585
16	17 48 27.00	2.4371	25 13 31.1	3.439
17	17 50 53.36	2.4417	25 16 53.0	3.292
18	17 53 20.00	2.4462	25 20 6.1	3.144
19	17 55 46.91	2.4507	25 23 10.3	2.995
20	17 58 14.09	2.4552	25 26 5.5	2.845
21	18 0 41.53	2.4595	25 28 51.7	2.694
22	18 3 9.23	2.4637	25 31 28.8	2.543
23	18 5 37.17	2.4678	S. 25 33 56.9	2.392

WEDNESDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 8 5.36	2.4718	S. 25 36 15.8	2.238

PHASES OF THE MOON.

		d	h	m
☾	Last Quarter . . Mar.	3	7	37.5
●	New Moon	9	23	50.7
☽	First Quarter. . . .	16	21	10.5
○	Full Moon	25	1	11.9

		d	h
☾	Perigee . . . . Mar.	9	12.7
☾	Apogee	22	9.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Regulus	W.	75° 9′ 10″	2867	76° 42′ 11″	2855	78° 15′ 27″	2844	79° 48′ 58″	2832
	Saturn	W.	59 23 0	2832	60 56 46	2821	62 30 46	2809	64 5 2	2798
	Spica	W.	21 34 30	3007	23 4 34	2979	24 35 13	2953	26 6 25	2928
	Venus	E.	71 3 38	3276	69 38 58	3265	68 14 5	3253	66 48 58	3241
	α Aquilæ	E.	77 22 22	3676	76 5 9	3676	74 47 56	3677	73 30 45	3679
	Sun	E.	117 8 52	3240	115 43 30	3227	114 17 53	3215	112 52 2	3202
2	Regulus	W.	87 40 28	2769	89 15 36	2756	90 51 2	2742	92 26 46	2728
	Saturn	W.	72 0 18	2735	73 36 12	2721	75 12 24	2707	76 48 54	2693
	Spica	W.	33 49 38	2825	35 23 34	2805	36 57 55	2787	38 32 40	2769
	Venus	E.	59 39 44	3176	58 13 6	3163	56 46 12	3148	55 19 1	3134
	α Aquilæ	E.	67 5 52	3710	65 49 16	3722	64 32 52	3734	63 16 41	3748
	Sun	E.	105 38 42	3132	104 11 11	3117	102 43 22	3101	101 15 14	3087
3	Saturn	W.	84 56 15	2619	86 34 44	2603	88 13 35	2588	89 52 47	2572
	Spica	W.	46 32 16	2681	48 9 22	2663	49 46 52	2645	51 24 46	2628
	Venus	E.	47 58 43	3060	46 29 45	3046	45 0 29	3030	43 30 54	3015
	α Aquilæ	E.	57 0 32	3865	55 46 37	3898	54 33 15	3936	53 20 32	3978
	Sun	E.	93 49 45	3004	92 19 37	2988	90 49 9	2970	89 18 19	2953
4	Spica	W.	59 40 18	2538	61 20 39	2520	63 1 25	2502	64 42 36	2483
	Venus	E.	35 58 20	2942	34 26 54	2928	32 55 11	2916	31 23 12	2905
	Sun	E.	81 38 33	2862	80 5 26	2845	78 31 56	2826	76 58 2	2807
5	Spica	W.	73 14 57	2393	74 58 42	2375	76 42 53	2357	78 27 29	2339
	Antares	W.	27 26 27	2433	29 9 15	2410	30 52 36	2387	32 36 30	2365
	Sun	E.	69 2 24	2714	67 26 3	2695	65 49 17	2678	64 12 7	2659
6	Spica	W.	87 16 52	2254	89 3 59	2237	90 51 31	2221	92 39 27	2206
	Antares	W.	41 23 39	2264	43 10 32	2245	44 57 52	2227	46 45 39	2210
	Sun	E.	56 0 11	2572	54 20 37	2555	52 40 40	2538	51 0 20	2523
7	Spica	W.	101 44 48	2133	103 34 57	2120	105 25 25	2107	107 16 13	2096
	Antares	W.	55 50 47	2131	57 40 59	2116	59 31 33	2103	61 22 27	2090
	Sun	E.	42 33 30	2453	40 51 11	2441	39 8 35	2430	37 25 43	2421
8	Antares	W.	70 41 43	2034	72 34 24	2025	74 27 19	2017	76 20 27	2009
	Sun	E.	28 48 32	2391	27 4 45	2392	25 20 59	2396	23 37 18	2403
11	Sun	W.	15 0 16	2553	16 40 15	2512	18 21 11	2469	20 2 40	2477
	Aldebaran	E.	63 1 14	2044	61 8 49	2055	59 16 40	2066	57 24 49	2079
	Pollux	E.	107 6 26	2026	105 13 33	2037	103 20 56	2047	101 28 35	2057
12	Sun	W.	28 31 33	2489	30 13 2	2497	31 54 20	2507	33 35 24	2519
	Aldebaran	E.	48 10 30	2151	46 20 58	2168	44 31 42	2186	42 42 53	2204
	Pollux	E.	92 11 20	2122	90 20 54	2137	88 30 51	2151	86 41 10	2167
13	Sun	W.	41 56 3	2593	43 35 7	2610	45 13 48	2628	46 52 5	2646
	Aldebaran	E.	33 46 9	2311	32 0 25	2335	30 15 17	2362	28 30 48	2391
	Pollux	E.	77 38 50	2251	75 51 38	2269	74 4 53	2287	72 18 35	2305
14	Sun	W.	54 57 19	2741	56 33 5	2760	58 8 25	2780	59 43 19	2801

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Regulus	W.	81° 22′ 44″	2820	82° 56′ 46″	2808	84° 31′ 3″	2795	86° 5′ 37″	2782
	Saturn	W.	65 39 33	2785	67 14 20	2773	68 49 23	2761	70 24 42	2748
	Spica	W.	27 38 8	2905	29 10 20	2883	30 43 0	2863	32 16 6	2843
	Venus	E.	65 23 37	3228	63 58 1	3216	62 32 11	3203	61 6 5	3190
	α Aquilæ	E.	72 13 36	3683	70 56 31	3688	69 39 31	3693	68 22 37	3702
	Sun	E.	111 25 55	3188	109 59 31	3175	108 32 52	3161	107 5 56	3146
2	Regulus	W.	94 2 49	2713	95 39 11	2699	97 15 52	2684	98 52 53	2669
	Saturn	W.	78 25 43	2679	80 2 51	2664	81 40 19	2649	83 18 7	2635
	Spica	W.	40 7 48	2751	41 43 20	2734	43 19 15	2716	44 55 34	2698
	Venus	E.	53 51 33	3119	52 23 47	3105	50 55 44	3091	49 27 23	3075
	α Aquilæ	E.	62 0 45	3767	60 45 8	3786	59 29 51	3809	58 14 58	3835
	Sun	E.	99 46 48	3070	98 18 2	3054	96 48 56	3039	95 19 31	3022
3	Saturn	W.	91 32 21	2555	93 12 18	2539	94 52 37	2522	96 33 19	2505
	Spica	W.	53 3 3	2610	54 41 45	2592	56 20 51	2574	58 0 22	2556
	Venus	E.	42 1 0	3001	40 30 48	2985	39 0 17	2971	37 29 28	2956
	α Aquilæ	E.	52 8 31	4028	50 57 19	4082	49 47 0	4144	48 37 41	4214
	Sun	E.	87 47 7	2935	86 15 33	2917	84 43 36	2899	83 11 16	2881
4	Spica	W.	66 24 13	2465	68 6 16	2447	69 48 44	2429	71 31 38	2411
	Venus	E.	29 50 59	2894	28 18 32	2884	26 45 53	2876	25 13 3	2867
	Sun	E.	75 23 43	2788	73 49 0	2770	72 13 53	2751	70 38 21	2732
5	Spica	W.	80 12 31	2322	81 57 58	2304	83 43 51	2287	85 30 9	2270
	Antares	W.	34 20 55	2344	36 5 51	2322	37 51 18	2302	39 37 14	2283
	Sun	E.	62 34 32	2641	60 56 33	2624	59 18 10	2605	57 39 22	2588
6	Spica	W.	94 27 46	2190	96 16 28	2175	98 5 33	2161	99 55 0	2147
	Antares	W.	48 33 51	2193	50 22 29	2177	52 11 31	2161	54 0 57	2145
	Sun	E.	49 19 39	2508	47 38 37	2493	45 57 14	2479	44 15 31	2466
7	Spica	W.	109 7 19	2083	110 58 42	2073	112 50 22	2064	114 42 17	2055
	Antares	W.	63 13 42	2077	65 5 16	2066	66 57 8	2055	68 49 17	2044
	Sun	E.	35 42 38	2412	33 59 20	2405	32 15 52	2398	30 32 15	2394
8	Antares	W.	78 13 47	2003	80 7 17	1996	82 0 57	1991	83 54 45	1988
	Sun	E.	21 53 47	2415	20 10 34	2432	18 27 45	2455	16 45 29	2487
11	Sun	W.	21 44 26	2473	23 26 17	2473	25 8 8	2477	26 49 54	2482
	Aldebaran	E.	55 33 17	2092	53 42 5	2105	51 51 14	2120	50 0 45	2135
	Pollux	E.	99 36 30	2069	97 44 43	2081	95 53 15	2094	94 2 7	2108
12	Sun	W.	35 16 11	2532	36 56 40	2546	38 36 49	2561	40 16 37	2577
	Aldebaran	E.	40 54 32	2224	39 6 40	2244	37 19 18	2265	35 32 27	2287
	Pollux	E.	84 51 53	2183	83 3 0	2199	81 14 31	2216	79 26 28	2233
13	Sun	W.	48 29 58	2663	50 7 27	2683	51 44 30	2702	53 21 7	2721
	Aldebaran	E.	26 47 0	2422	25 3 56	2455	23 21 39	2491	21 40 13	2532
	Pollux	E.	70 32 43	2324	68 47 18	2343	67 2 21	2362	65 17 51	2381
14	Sun	W.	61 17 47	2820	62 51 49	2840	64 25 25	2859	65 58 36	2880

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
14	Mars	W.	14° 21′ 56″	2716	15° 58′ 15″	2720	17° 34′ 28″	2728	19° 10′ 31″	2738
	Pollux	E.	63 33 49	2400	61 50 14	2419	60 7 7	2439	58 24 28	2458
	Regulus	E.	99 44 44	2405	98 1 16	2424	96 18 16	2443	94 35 43	2462
15	Sun	W.	67 31 21	2899	69 3 41	2920	70 35 35	2938	72 7 5	2958
	α Arietis	W.	27 57 15	3046	29 26 31	3018	30 56 22	2995	32 26 41	2977
	Mars	W.	27 6 43	2811	28 40 57	2828	30 14 49	2845	31 48 19	2862
	Pollux	E.	49 58 2	2556	48 18 6	2574	46 38 36	2593	44 59 32	2613
	Regulus	E.	86 9 39	2557	84 29 45	2576	82 50 17	2594	81 11 14	2613
16	Sun	W.	79 38 33	3052	81 7 41	3071	82 36 26	3088	84 4 50	3106
	α Arietis	W.	40 2 7	2945	41 33 29	2946	43 4 49	2949	44 36 6	2953
	Pollux	E.	36 50 41	2707	35 14 11	2725	33 38 5	2744	32 2 24	2763
	Regulus	E.	73 2 12	2702	71 25 35	2719	69 49 21	2736	68 13 29	2753
17	Sun	W.	91 21 38	3188	92 48 1	3204	94 14 5	3220	95 39 51	3234
	α Arietis	W.	52 10 56	2984	53 41 29	2991	55 11 53	2999	56 42 7	3006
	Regulus	E.	60 19 34	2832	58 45 48	2847	57 12 21	2861	55 39 12	2876
18	Sun	W.	102 44 34	3300	104 8 45	3313	105 32 41	3325	106 56 24	3336
	α Arietis	W.	64 10 49	3047	65 40 3	3055	67 9 8	3063	68 38 3	3071
	Aldebaran	W.	33 6 12	2981	34 36 49	2987	36 7 18	2993	37 37 39	3001
	Regulus	E.	47 57 55	2942	46 26 30	2954	44 55 20	2967	43 24 26	2978
	Spica	E.	102 1 10	2939	100 29 41	2950	98 58 26	2961	97 27 24	2970
19	Sun	W.	113 51 52	3386	115 14 24	3395	116 36 46	3403	117 58 59	3412
	α Arietis	W.	76 0 20	3106	77 28 22	3113	78 56 16	3119	80 24 3	3125
	Aldebaran	W.	45 7 19	3032	46 36 52	3039	48 6 17	3044	49 35 35	3049
	Regulus	E.	35 53 30	3035	34 24 1	3046	32 54 45	3057	31 25 43	3068
	Saturn	E.	50 3 2	2977	48 32 20	2985	47 1 48	2993	45 31 26	3000
	Spica	E.	89 55 13	3016	88 25 20	3023	86 55 36	3030	85 26 1	3038
20	Sun	W.	124 47 54	3446	126 9 19	3452	127 30 37	3457	128 51 49	3462
	α Arietis	W.	87 41 12	3152	89 8 19	3156	90 35 21	3161	92 2 17	3164
	Aldebaran	W.	57 0 32	3073	58 29 15	3077	59 57 53	3081	61 26 26	3083
	Saturn	E.	38 1 47	3033	36 32 15	3039	35 2 50	3044	33 33 32	3050
	Spica	E.	78 0 9	3068	76 31 20	3073	75 2 37	3077	73 33 59	3082
21	Aldebaran	W.	68 48 23	3095	70 16 39	3096	71 44 53	3098	73 13 5	3099
	Pollux	W.	24 39 9	3110	26 7 7	3108	27 35 7	3106	29 3 9	3105
	Saturn	E.	26 8 38	3075	24 39 58	3080	23 11 24	3086	21 42 57	3093
	Spica	E.	66 12 2	3098	64 43 50	3101	63 15 41	3103	61 47 35	3105
22	Aldebaran	W.	80 33 55	3100	82 2 5	3099	83 30 16	3098	84 58 28	3097
	Pollux	W.	36 23 45	3098	37 51 57	3096	39 20 12	3095	40 48 28	3092
	Spica	E.	54 27 36	3111	52 59 40	3113	51 31 46	3114	50 3 53	3114
	Antares	E.	100 18 28	3093	98 50 10	3092	97 21 51	3092	95 53 32	3091
23	Aldebaran	W.	92 19 51	3089	93 48 14	3087	95 16 40	3085	96 45 8	3082
	Pollux	W.	48 10 30	3081	49 39 3	3078	51 7 40	3074	52 36 21	3072
	Spica	E.	42 44 34	3116	41 16 44	3116	39 48 54	3117	38 21 5	3119
	Antares	E.	88 31 29	3082	87 2 58	3080	85 34 24	3078	84 5 47	3075

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Mars	W.	20° 46′ 21″	2750	22° 21′ 55″	2763	23° 57′ 11″	2779	25° 32′ 7″	2794
	Pollux	E.	56 42 16	2478	55 0 32	2497	53 19 15	2517	51 38 25	2536
	Regulus	E.	92 53 37	2482	91 11 58	2500	89 30 45	2518	87 49 59	2536
15	Sun	W.	73 38 11	2977	75 8 52	2997	76 39 9	3016	78 9 2	3034
	α Arietis	W.	33 57 22	2965	35 28 19	2954	36 59 29	2949	38 30 46	2946
	Mars	W.	33 21 26	2880	34 54 11	2896	36 26 35	2914	37 58 36	2931
	Pollux	E.	43 20 55	2639	41 42 43	2651	40 4 57	2669	38 27 36	2689
	Regulus	E.	79 32 37	2631	77 54 24	2649	76 16 36	2667	74 39 12	2685
16	Sun	W.	85 32 52	3124	87 0 33	3139	88 27 55	3157	89 54 56	3173
	α Arietis	W.	46 7 18	2958	47 38 24	2963	49 9 23	2969	50 40 14	2977
	Pollux	E.	30 27 7	2781	28 52 14	2800	27 17 46	2818	25 43 42	2837
	Regulus	E.	66 38 0	2769	65 2 32	2786	63 28 6	2801	61 53 40	2817
17	Sun	W.	97 5 20	3247	98 30 33	3262	99 55 29	3276	101 20 9	3288
	α Arietis	W.	58 12 12	3014	59 42 7	3023	61 11 51	3031	62 41 25	3039
	Regulus	E.	54 6 22	2890	52 33 50	2903	51 1 35	2916	49 29 37	2929
18	Sun	W.	108 19 54	3347	109 43 11	3358	111 6 16	3368	112 29 9	3377
	α Arietis	W.	70 6 48	3078	71 35 24	3086	73 3 51	3093	74 32 10	3100
	Aldebaran	W.	39 7 51	3007	40 37 55	3014	42 7 51	3020	43 37 39	3026
	Regulus	E.	41 53 46	2990	40 23 21	3001	38 53 10	3013	37 23 13	3024
	Spica	E.	95 56 34	2981	94 25 57	2989	92 55 31	2999	91 25 17	3007
19	Sun	W.	119 21 2	3419	120 42 57	3427	122 4 43	3433	123 26 22	3439
	α Arietis	W.	81 51 42	3131	83 19 14	3136	84 46 40	3142	86 13 59	3147
	Aldebaran	W.	51 4 47	3055	52 33 52	3060	54 2 51	3065	55 31 44	3069
	Regulus	E.	29 56 54	3080	28 28 20	3091	27 0 0	3106	25 31 56	3118
	Saturn	E.	44 1 13	3007	42 31 9	3014	41 1 14	3021	39 31 27	3028
	Spica	E.	83 56 35	3044	82 27 17	3051	80 58 7	3057	79 29 5	3062
20	Sun	W.	130 12 56	3467	131 33 57	3471	132 54 53	3475	134 15 45	3479
	α Arietis	W.	93 29 9	3168	94 55 56	3172	96 22 39	3176	97 49 17	3178
	Aldebaran	W.	62 54 56	3087	64 23 22	3089	65 51 45	3091	67 20 5	3093
	Saturn	E.	32 4 21	3055	30 35 16	3060	29 6 17	3065	27 37 24	3070
	Spica	E.	72 5 27	3086	70 36 59	3089	69 8 36	3093	67 40 17	3096
21	Aldebaran	W.	74 41 16	3100	76 9 26	3100	77 37 36	3101	79 5 45	3100
	Pollux	W.	30 31 13	3103	31 59 19	3102	33 27 26	3101	34 55 35	3100
	Saturn	E.	20 14 39	3101	18 46 30	3109	17 18 31	3119	15 50 45	3132
	Spica	E.	60 19 32	3107	58 51 31	3108	57 23 31	3110	55 55 33	3110
22	Aldebaran	W.	86 26 41	3096	87 54 56	3095	89 23 12	3093	90 51 30	3091
	Pollux	W.	42 16 47	3090	43 45 9	3088	45 13 33	3086	46 42 0	3083
	Spica	E.	48 36 0	3114	47 8 8	3114	45 40 16	3115	44 12 25	3115
	Antares	E.	94 25 11	3069	92 56 48	3068	91 28 24	3067	89 59 58	3064
23	Aldebaran	W.	98 13 40	3079	99 42 15	3077	101 10 53	3073	102 39 35	3069
	Pollux	W.	54 5 5	3069	55 33 53	3065	57 2 46	3061	58 31 43	3058
	Spica	E.	36 53 18	3119	35 25 32	3120	33 57 47	3123	32 30 5	3125
	Antares	E.	82 37 7	3072	81 8 23	3069	79 39 36	3066	78 10 45	3063

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
24	Pollux	W.	60° 0′ 44″	3054	61° 29′ 50″	3050	62° 59′ 1″	3046	64° 28′ 17″	3042
	Regulus	W.	24 5 45	3122	25 33 28	3111	27 1 24	3101	28 29 33	3091
	Spica	E.	31 2 26	3129	29 34 51	3133	28 7 21	3138	26 39 58	3145
	Antares	E.	76 41 50	3060	75 12 51	3056	73 43 47	3052	72 14 39	3048
25	Pollux	W.	71 55 59	3018	73 25 49	3013	74 55 46	3008	76 25 49	3003
	Regulus	W.	35 53 3	3050	37 22 14	3042	38 51 35	3034	40 21 5	3028
	Saturn	W.	21 54 29	3022	23 24 15	3014	24 54 11	3005	26 24 18	2997
	Antares	E.	64 47 44	3027	63 18 5	3023	61 48 21	3018	60 18 31	3014
26	Pollux	W.	83 57 43	2975	85 28 27	2969	86 59 18	2963	88 30 17	2957
	Regulus	W.	47 50 44	2993	49 21 6	2985	50 51 37	2979	52 22 16	2972
	Saturn	W.	33 57 14	2960	35 28 17	2954	36 59 28	2946	38 30 48	2939
	Antares	E.	52 47 53	2989	51 17 27	2985	49 46 55	2980	48 16 17	2974
	α Aquilæ	E.	100 19 10	3775	99 3 42	3762	97 48 0	3750	96 32 6	3740
27	Pollux	W.	96 7 12	2924	97 39 0	2918	99 10 56	2911	100 43 1	2904
	Regulus	W.	59 57 45	2936	61 29 18	2928	63 1 1	2921	64 32 53	2914
	Saturn	W.	46 9 42	2905	47 41 55	2897	49 14 18	2890	50 46 50	2882
	Antares	E.	40 41 31	2950	39 10 15	2946	37 38 54	2941	36 7 27	2936
	α Aquilæ	E.	90 10 3	3698	88 53 14	3692	87 36 18	3687	86 19 17	3682
	Venus	E.	115 29 37	3369	114 6 45	3361	112 43 44	3353	111 20 34	3345
28	Regulus	W.	72 14 37	2875	73 47 28	2866	75 20 30	2858	76 53 43	2850
	Saturn	W.	58 31 57	2843	60 5 29	2835	61 39 11	2827	63 13 4	2819
	Spica	W.	18 44 14	3053	20 13 21	3020	21 43 9	2991	23 13 33	2965
	α Aquilæ	E.	79 53 22	3675	78 36 8	3675	77 18 54	3677	76 1 43	3680
	Venus	E.	104 22 17	3302	102 58 8	3293	101 33 48	3284	100 9 18	3275
	Fomalhaut	E.	111 4 43	3057	109 35 41	3046	108 6 25	3034	106 36 55	3022
29	Regulus	W.	84 42 32	2806	86 16 52	2796	87 51 25	2787	89 26 10	2777
	Saturn	W.	71 5 13	2775	72 40 14	2766	74 15 27	2756	75 50 52	2747
	Spica	W.	30 52 41	2868	32 25 41	2853	33 59 0	2838	35 32 38	2824
	α Aquilæ	E.	69 37 6	3717	68 20 37	3727	67 4 19	3741	65 48 15	3756
	Venus	E.	93 4 1	3226	91 38 23	3216	90 12 33	3205	88 46 30	3195
	Fomalhaut	E.	99 5 54	2969	97 35 2	2958	96 3 56	2947	94 32 37	2937
	Sun	E.	135 28 17	3172	134 1 34	3161	132 34 38	3150	131 7 29	3138
30	Regulus	W.	97 23 7	2727	98 59 11	2717	100 35 28	2707	102 11 59	2695
	Saturn	W.	83 51 11	2697	85 27 55	2686	87 4 54	2675	88 42 7	2665
	Spica	W.	43 25 22	2756	45 0 47	2744	46 36 29	2731	48 12 28	2718
	α Aquilæ	E.	59 32 39	3866	58 18 45	3898	57 5 23	3931	55 52 35	3969
	Venus	E.	81 33 6	3140	80 5 45	3129	78 38 10	3117	77 10 21	3105
	Fomalhaut	E.	86 52 47	2887	85 20 11	2876	83 47 22	2867	82 14 21	2857
	Sun	E.	123 48 10	3079	122 19 35	3066	120 50 44	3055	119 21 39	3043
31	Saturn	W.	96 51 55	2608	98 30 39	2596	100 9 40	2584	101 48 57	2572
	Spica	W.	56 16 41	2653	57 54 24	2640	59 32 24	2626	61 10 43	2614
	α Aquilæ	E.	49 59 31	4235	48 51 38	4309	47 44 54	4390	46 39 24	4481
	Venus	E.	69 47 35	3043	68 18 15	3030	66 48 40	3018	65 18 49	3005
	Fomalhaut	E.	74 26 11	2811	72 51 57	2802	71 17 32	2794	69 42 56	2786
	Sun	E.	111 52 18	2977	110 21 37	2965	108 50 40	2951	107 19 26	2937

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
24	Pollux	W.	65° 57′ 38″	3037	67° 27′ 5″	3033	68° 56′ 37″	3028	70° 26′ 15″	3023
	Regulus	W.	29 57 53	3082	31 26 25	3073	32 55 8	3065	34 24 1	3057
	Spica	E.	25 12 43	3154	23 45 39	3166	22 18 48	3179	20 52 14	3198
	Antares	E.	70 45 26	3044	69 16 8	3040	67 46 45	3036	66 17 17	3032
25	Pollux	W.	77 55 58	2997	79 26 14	2992	80 56 37	2986	82 27 7	2981
	Regulus	W.	41 50 43	3021	43 20 30	3014	44 50 26	3007	46 20 31	3000
	Saturn	W.	27 54 34	2989	29 25 0	2981	30 55 36	2975	32 26 20	2967
	Antares	E.	58 48 35	3009	57 18 33	3005	55 48 26	3000	54 18 13	2994
26	Pollux	W.	90 1 24	2950	91 32 39	2944	93 4 2	2938	94 35 33	2931
	Regulus	W.	53 53 4	2965	55 24 0	2958	56 55 6	2950	58 26 21	2943
	Saturn	W.	40 2 17	2932	41 33 55	2925	43 5 42	2918	44 37 38	2912
	Antares	E.	46 45 32	2969	45 14 41	2965	43 43 44	2960	42 12 41	2954
	α Aquilæ	E.	95 16 1	3729	93 59 45	3721	92 43 20	3712	91 26 46	3704
27	Pollux	W.	102 15 15	2897	103 47 38	2890	105 20 10	2882	106 52 52	2874
	Regulus	W.	66 4 54	2906	67 37 5	2898	69 9 26	2891	70 41 56	2883
	Saturn	W.	52 19 32	2874	53 52 24	2867	55 25 25	2859	56 58 36	2852
	Antares	E.	34 35 54	2932	33 4 16	2928	31 32 33	2925	30 0 46	2922
	α Aquilæ	E.	85 2 11	3679	83 45 2	3677	82 27 50	3675	81 10 36	3675
	Venus	E.	109 57 14	3336	108 33 44	3328	107 10 5	3319	105 46 16	3311
28	Regulus	W.	78 27 6	2842	80 0 40	2832	81 34 26	2824	83 8 23	2815
	Saturn	W.	64 47 7	2811	66 21 21	2801	67 55 47	2793	69 30 24	2784
	Spica	W.	24 44 29	2942	26 15 54	2921	27 47 46	2903	29 20 2	2884
	α Aquilæ	E.	74 44 35	3685	73 27 32	3691	72 10 35	3698	70 53 46	3707
	Venus	E.	98 44 37	3265	97 19 45	3256	95 54 42	3246	94 29 27	3236
	Fomalhaut	E.	105 7 10	3011	103 37 11	3001	102 6 59	2989	100 36 33	2979
29	Regulus	W.	91 1 8	2768	92 36 18	2758	94 11 41	2748	95 47 17	2738
	Saturn	W.	77 26 29	2738	79 2 19	2727	80 38 23	2717	82 14 40	2707
	Spica	W.	37 6 35	2810	38 40 50	2796	40 15 23	2782	41 50 14	2769
	α Aquilæ	E.	64 32 27	3773	63 16 57	3792	62 1 47	3815	60 47 0	3840
	Venus	E.	87 20 15	3184	85 53 47	3174	84 27 7	3163	83 0 13	3152
	Fomalhaut	E.	93 1 5	2927	91 29 20	2916	89 57 22	2906	88 25 11	2896
	Sun	E.	129 40 5	3126	128 12 27	3115	126 44 36	3103	125 16 30	3091
30	Regulus	W.	103 48 45	2686	105 25 45	2673	107 3 1	2663	108 40 31	2651
	Saturn	W.	90 19 34	2654	91 57 16	2642	93 35 14	2631	95 13 27	2620
	Spica	W.	49 48 44	2705	51 25 17	2692	53 2 8	2679	54 39 16	2666
	α Aquilæ	E.	54 40 25	4012	53 28 57	4059	52 18 15	4112	51 8 25	4171
	Venus	E.	75 42 18	3093	74 14 0	3081	72 45 27	3069	71 16 30	3056
	Fomalhaut	E.	80 41 7	2848	79 7 41	2838	77 34 3	2829	76 0 13	2820
	Sun	E.	117 52 19	3030	116 22 43	3017	114 52 51	3004	113 22 43	2990
31	Saturn	W.	103 28 31	2559	105 8 22	2547	106 48 30	2535	108 28 55	2522
	Spica	W.	62 49 19	2601	64 28 13	2587	66 7 26	2574	67 46 57	2560
	α Aquilæ	E.	45 35 15	4562	44 32 35	4697	43 31 33	4826	42 32 18	4970
	Venus	E.	63 48 42	2991	62 18 18	2978	60 47 38	2965	59 16 41	2952
	Fomalhaut	E.	68 8 10	2778	66 33 13	2771	64 58 7	2763	63 22 51	2756
	Sun	E.	105 47 54	2922	104 16 4	2909	102 43 57	2895	101 11 32	2881

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	0 42 13.28	9.100	N. 4 32 38.8	+57.85	16 2.19	64.51	3 58.76	0.755
Thur.	2	0 45 51.73	9.105	4 55 44.7	57.64	16 1.91	64.53	3 40.71	0.750
Frid.	3	0 49 30.33	9.111	5 18 45.5	57.42	16 1.62	64.55	3 22.80	0.744
Sat.	4	0 53 9.09	9.118	5 41 40.8	+57.18	16 1.34	64.57	3 5 04	0.737
SUN.	5	0 56 48.02	9.126	6 4 30.2	56 93	16 1.06	64.59	2 47.47	0.729
Mon.	6	1 0 27.16	9.135	6 27 13.5	56.66	16 0.78	64.62	2 30.10	0.721
Tues.	7	1 4 6.50	9.143	6 49 50.2	+56.37	16 0.50	64.65	2 12 94	0.712
Wed.	8	1 7 46.07	9.153	7 12 20.0	56.09	16 0.23	64.69	1 56.00	0.703
Thur.	9	1 11 25.88	9.163	7 34 42.6	55.78	15 59.95	64.72	1 39.30	0.692
Frid.	10	1 15 5.94	9.174	7 56 57.5	+55.46	15 59.68	64.76	1 22.85	0.681
Sat.	11	1 18 46.26	9.186	8 19 4.4	55.12	15 59.41	64.80	1 6.66	0.669
SUN.	12	1 22 26.87	9.198	8 41 2.9	54.76	15 59.14	64.85	0 50.76	0.657
Mon.	13	1 26 7.77	9.210	9 2 52.6	+54.39	15 58.87	64.89	0 35.15	0.645
Tues.	14	1 29 48.97	9.223	9 24 33.2	54.00	15 58.61	64.94	0 19.84	0.632
Wed.	15	1 33 30.49	9.237	9 46 4.4	53.60	15 58.35	64.99	0 4.85	0.618
Thur.	16	1 37 12.35	9.251	10 7 25.7	+53.18	15 58.09	65.05	0 9.80	0.604
Frid.	17	1 40 54 56	9.266	10 28 36.8	52.75	15 57.83	65.10	0 24.11	0.589
Sat.	18	1 44 37.14	9.282	10 49 37.6	52.31	15 57.57	65.16	0 38.05	0.574
SUN.	19	1 48 20.10	9.298	11 10 27.7	+51.85	15 57.31	65.22	0 51.61	0.558
Mon.	20	1 52 3.46	9.315	11 31 6.6	51.38	15 57.05	65.28	1 4.77	0.541
Tues.	21	1 55 47.23	9.333	11 51 34.1	50.90	15 56.79	65.34	1 17.52	0 523
Wed.	22	1 59 31.43	9.351	12 11 49.8	+50.40	15 56.54	65.41	1 29.84	0.505
Thur.	23	2 3 16.08	9.370	12 31 53.4	49.89	15 56.28	65.48	1 41.72	0.486
Frid.	24	2 7 1.19	9.390	12 51 44.7	49.37	15 56.03	65.55	1 53.14	0.466
Sat.	25	2 10 46.77	9.410	13 11 23.4	+48.84	15 55.78	65.62	2 4.08	0.446
SUN.	26	2 14 32.84	9.430	13 30 49.2	48.29	15 55.53	65 69	2 14.53	0.426
Mon.	27	2 18 19.42	9.451	13 50 1.8	47.74	15 55.28	65.76	2 24.47	0.405
Tues.	28	2 22 6.52	9.473	14 9 0.8	+47.17	15 55.03	65.84	2 33.90	0.383
Wed.	29	2 25 54.14	9.495	14 27 45.9	46.59	15 54.78	65.91	2 42.81	0.361
Thur.	30	2 29 42.31	9.518	14 46 16.9	45.99	15 54 53	65.99	2 51.17	0.338
Frid.	31	2 33 31.03	9.541	N.15 4 33.4	+45.38	15 54.28	66.06	2 58.98	0.315

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	0 42 12.68	9.102	N. 4 32 35.0	+57.86	3 58.81	0.755	0 38 13.87
Thur.	2	0 45 51.18	9.107	4 55 41.2	57.65	3 40.75	0.750	0 42 10.43
Frid.	3	0 49 29.82	9.113	5 18 42.3	57.43	3 22.84	0.744	0 46 6.98
Sat.	4	0 53 8.62	9.120	5 41 37.9	+57.19	3 5.08	0.737	0 50 3.54
SUN.	5	0 56 47.60	9.128	6 4 27.6	56.94	2 47.51	0.729	0 54 0.09
Mon.	6	1 0 26.78	9.136	6 27 11.1	56.67	2 30.13	0.721	0 57 56.65
Tues.	7	1 4 6.17	9.145	6 49 48.1	+56.38	2 12.97	0.712	1 1 53.20
Wed.	8	1 7 45.78	9.154	7 12 18.2	56.10	1 56.03	0.703	1 5 49.75
Thur.	9	1 11 25.63	9.165	7 34 41.0	55.79	1 39.32	0.692	1 9 46.31
Frid.	10	1 15 5.73	9.176	7 56 56.2	+55.47	1 22.86	0.681	1 13 42.87
Sat.	11	1 18 46.09	9.188	8 19 3.4	55.13	1 6.67	0.669	1 17 39.42
SUN.	12	1 22 26.74	9.200	8 41 2.1	54.77	0 50.76	0.657	1 21 35.98
Mon.	13	1 26 7.68	9.212	9 2 52.0	+54.40	0 35.15	0.645	1 25 32.53
Tues.	14	1 29 48.92	9.225	9 24 32.9	54.01	0 19.84	0.632	1 29 29.08
Wed.	15	1 33 30.48	9.239	9 46 4.4	53.61	0 4.85	0.618	1 33 25.63
Thur.	16	1 37 12.38	9.253	10 7 25.9	+53.19	0 9.80	0.604	1 37 22.18
Frid.	17	1 40 54.63	9.268	10 28 37.2	52.76	0 24.11	0.589	1 41 18.74
Sat.	18	1 44 37.24	9.283	10 49 38.2	52.32	0 38.06	0.574	1 45 15.30
SUN.	19	1 48 20.23	9.299	11 10 28.5	+51.86	0 51.62	0.558	1 49 11.85
Mon.	20	1 52 3.62	9.316	11 31 7.6	51.39	1 4.78	0.541	1 53 8.40
Tues.	21	1 55 47.43	9.334	11 51 35.2	50.91	1 17.52	0.523	1 57 4.96
Wed.	22	1 59 31.66	9.352	12 11 51.1	+50.41	1 29.85	0.505	2 1 1.51
Thur.	23	2 3 16.34	9.371	12 31 54.9	49.90	1 41.73	0.486	2 4 58.07
Frid.	24	2 7 1.48	9.391	12 51 46.3	49.38	1 53.15	0.466	2 8 54.63
Sat.	25	2 10 47.09	9.411	13 11 25.1	+48.85	2 4.09	0.446	2 12 51.18
SUN.	26	2 14 33.19	9.431	13 30 51.0	48.30	2 14.54	0.426	2 16 47.73
Mon.	27	2 18 19.80	9.452	13 50 3.7	47.74	2 24.49	0.405	2 20 44.29
Tues.	28	2 22 6.92	9.474	14 9 2.8	+47.17	2 33.92	0.383	2 24 40.84
Wed.	29	2 25 54.57	9.496	14 27 48.0	46.59	2 42.83	0.361	2 28 37.40
Thur.	30	2 29 42.76	9.519	14 46 19.0	45.99	2 51.19	0.338	2 32 33.95
Frid.	31	2 33 31.50	9.542	N. 15 4 35.6	+45.38	2 59.00	0.315	2 36 30.51

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 hour, + 9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	91	11 29 4.7	29 8.6	147.88	− 0.20	9.9999155	+53.4	23 17 56.48
2	92	12 28 13.0	28 16.8	147.81	0.30	0.0000440	53.4	23 14 0.57
3	93	13 27 19.5	27 23.2	147.74	0.39	0.0001722	53.3	23 10 4.66
4	94	14 26 24.3	26 27.8	147.66	− 0.45	0.0002998	+53.1	23 6 8.75
5	95	15 25 27.2	25 30.6	147.58	0.48	0.0004269	52.9	23 2 12.84
6	96	16 24 28.2	24 31.5	147.50	0.48	0.0005535	52.6	22 58 16.93
7	97	17 23 27.4	23 30.6	147.42	− 0.45	0.0006794	+52.3	22 54 21.02
8	98	18 22 24.7	22 27.8	147.34	0.39	0.0008044	51.9	22 50 25.11
9	99	19 21 20.0	21 23.0	147.26	0.30	0.0009284	51.5	22 46 29.21
10	100	20 20 13.2	20 16.1	147.17	− 0.18	0.0010515	+51.1	22 42 33.30
11	101	21 19 4.3	19 7.1	147.09	− 0.06	0.0011737	50.7	22 38 37.39
12	102	22 17 53.3	17 56.0	147.00	+ 0.07	0.0012950	50.3	22 34 41.48
13	103	23 16 40.1	16 42.7	146.91	+ 0.20	0.0014154	+49.9	22 30 45.58
14	104	24 15 24.6	15 27.1	146.81	0.34	0.0015349	49.6	22 26 49.67
15	105	25 14 6.8	14 9.2	146.72	0.46	0.0016536	49.3	22 22 53.76
16	106	26 12 46.8	12 49.1	146.62	+ 0 56	0.0017717	+49.1	22 18 57.85
17	107	27 11 24.6	11 26.8	146.53	0.64	0.0018892	48.9	22 15 1.95
18	108	28 10 0.2	10 2.3	146.44	0.69	0.0020063	48.7	22 11 6.04
19	109	29 8 33.6	8 35.5	146.35	+ 0.71	0.0021230	+48.5	22 7 10.13
20	110	30 7 4.8	7 6.6	146.26	0.70	0.0022393	48.4	22 3 14.23
21	111	31 5 33.9	5 35.6	146.17	0.66	0.0023553	48.3	21 59 18.32
22	112	32 4 1.1	4 2.7	146.09	+ 0.59	0.0024711	+48.2	21 55 22.41
23	113	33 2 26.3	2 27.8	146.01	0.50	0.0025868	48.1	21 51 26.50
24	114	34 0 49.6	0 51.0	145.93	0.39	0.0027023	48.1	21 47 30.59
25	115	34 59 11.1	59 12.3	145.86	+ 0.26	0.0028175	+47.9	21 43 34.68
26	116	35 57 30 8	57 31.9	145.79	+ 0.13	0.0029324	47.8	21 39 38.77
27	117	36 55 48.9	55 49.9	145 72	0.00	0.0030468	47.6	21 35 42.86
28	118	37 54 5.4	54 6.3	145.66	− 0.12	0.0031607	+47.3	21 31 46.95
29	119	38 52 20.4	52 21.1	145.59	0.23	0.0032740	47.0	21 27 51.05
30	120	39 50 33.8	50 34.4	145.53	0.32	0.0033866	46.6	21 23 55.14
31	121	40 48 45.8	48 46.2	145.47	− 0.39	0.0034983	+46.2	21 19 59.23

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 44.9	15 50.8	57 41.2	+1.78	58 2.8	+1.82	18 12.4	2.45	22.0
2	15 56.8	16 2.8	58 24.8	1.85	58 46.8	1.82	19 11.9	2.47	23.0
3	16 8.7	16 14.4	59 8.5	1.78	59 29.4	1.69	20 11.0	2.43	24.0
4	16 19.7	16 24.6	59 49.1	+1.56	60 6.9	+1.39	21 8.4	2.35	25.0
5	16 28.7	16 32.2	60 22.4	1.17	60 34.9	0.91	22 3.6	2.26	26.0
6	16 34.7	16 36.2	60 44.2	+0.61	60 49.6	+0.28	22 56.7	2.19	27.0
7	16 36.5	16 35.7	60 50.9	−0.07	60 47.9	−0.43	23 48.6	2.16	28.0
8	16 33.7	16 30.6	60 40.6	0.78	60 29.1	1.12	δ		29.0
9	16 26.4	16 21.3	60 13.7	1.43	59 54.8	1.70	0 40.3	2.16	0.6
10	16 15.3	16 8.7	59 32.9	−1.93	59 8.6	−2.10	1 32.5	2.20	1.6
11	16 1.6	15 54.2	58 42.6	2.21	58 15.5	2.28	2 25.8	2.25	2.6
12	15 46.4	15 39.2	57 47.9	2.30	57 20.4	2.26	3 20.3	2.28	3.6
13	15 31.9	15 24.9	56 53.6	−2.19	56 27.8	−2.09	4 15.3	2.28	4.6
14	15 18.3	15 12.2	56 3.6	1.94	55 41.2	1.78	5 9.9	2.24	5.6
15	15 6.7	15 1.8	55 20.8	1.60	55 2.8	1.41	6 2.9	2.15	6.6
16	14 57.5	14 53.9	54 47.1	−1.20	54 34.0	−0.99	6 53.3	2.04	7.6
17	14 51.0	14 48.8	54 23.3	0.78	54 15.2	0.58	7 40.9	1.92	8.6
18	14 47.3	14 46.4	54 9.5	−0.37	54 6.3	−0.18	8 25.7	1.82	9.6
19	14 46.1	14 46.4	54 5.3	0.00	54 6.4	+0.18	9 8.3	1.74	10.6
20	14 47.3	14 48.6	54 9.7	+0.35	54 14.6	0.49	9 49.4	1.70	11.6
21	14 50.5	14 52.7	54 21.3	0.63	54 29.6	0.75	10 29.9	1.69	12.6
22	14 55.3	14 58.3	54 39.2	+0.85	54 49.9	+0.94	11 10.7	1.73	13.6
23	15 1.4	15 4.9	55 1.6	1.02	55 14.2	1.08	11 52.8	1.80	14.6
24	15 8.5	15 12.2	55 27.4	1.13	55 41.2	1.17	12 37.1	1.91	15.6
25	15 16.1	15 20.1	55 55.4	+1.20	56 10.0	+1.23	13 24.5	2.05	16.6
26	15 24.1	15 28.2	56 24.8	1.25	56 39.9	1.27	14 15.4	2.20	17.6
27	15 32.3	15 36.5	56 55.1	1.28	57 10.4	1.29	15 10.0	2.33	18.6
28	15 40.7	15 44.9	57 25.8	+1.29	57 41.2	+1.29	16 7.3	2.42	19.6
29	15 49.1	15 53.3	57 56.6	1.28	58 11.9	1.27	17 6.0	2.44	20.6
30	15 57.4	16 1.4	58 27.0	1.25	58 41.8	1.22	18 4.3	2.39	21.6
31	16 5.3	16 9.0	58 56.1	+1.17	59 9.6	+1.10	19 0.8	2.30	22.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 1.					**FRIDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 8 5.36	2.4718	S.25 36 15.8	2.238	0	20 9 28.70	2.5439	S.24 16 41.4	5.647
1	18 10 33.79	2.4758	25 38 25.5	2.084	1	20 12 1.30	2.5427	24 10 57.7	5.811
2	18 13 2.46	2.4797	25 40 25.9	1.929	2	20 14 33.82	2.5413	24 5 4.1	5.975
3	18 15 31.36	2.4836	25 42 17.0	1.774	3	20 17 6.26	2.5399	23 59 0.7	6.138
4	18 18 0.49	2.4873	25 43 58.8	1.617	4	20 19 38.61	2.5385	23 52 47.5	6.301
5	18 20 29.84	2.4909	25 45 31.1	1.460	5	20 22 10.88	2.5370	23 46 24.5	6.464
6	18 22 59.40	2.4944	25 46 54.0	1.303	6	20 24 43.05	2.5353	23 39 51.8	6.626
7	18 25 29.17	2.4978	25 48 7.5	1.145	7	20 27 15.12	2.5336	23 33 9.4	6.787
8	18 27 59.14	2.5011	25 49 11.4	0.985	8	20 29 47.08	2.5318	23 26 17.4	6.948
9	18 30 29.30	2.5043	25 50 5.7	0.825	9	20 32 18.93	2.5299	23 19 15.7	7.108
10	18 32 59.66	2.5075	25 50 50.4	0.665	10	20 34 50.67	2.5279	23 12 4.4	7.267
11	18 35 30.20	2.5104	25 51 25.5	0.504	11	20 37 22.28	2.5258	23 4 43.6	7.425
12	18 38 0.91	2.5133	25 51 50.9	0.342	12	20 39 53.77	2.5237	22 57 13.4	7.582
13	18 40 31.79	2.5161	25 52 6.6	0.180	13	20 42 25.13	2.5215	22 49 33.7	7.740
14	18 43 2.84	2.5188	25 52 12.5	− 0.017	14	20 44 56.35	2.5192	22 41 44.6	7.897
15	18 45 34.05	2.5214	25 52 8.6	+ 0.147	15	20 47 27.43	2.5168	22 33 46.1	8.052
16	18 48 5.41	2.5239	25 51 54.9	0.310	16	20 49 58.36	2.5143	22 25 38.3	8.207
17	18 50 36.92	2.5262	25 51 31.4	0.473	17	20 52 29.14	2.5118	22 17 21.3	8.360
18	18 53 8.56	2.5285	25 50 58.1	0.637	18	20 54 59.78	2.5093	22 8 55.1	8.513
19	18 55 40.34	2.5307	25 50 14.9	0.803	19	20 57 30.26	2.5066	22 0 19.8	8.665
20	18 58 12.24	2.5327	25 49 21.7	0.969	20	21 0 0.57	2.5038	21 51 35.3	8.817
21	19 0 44.26	2.5346	25 48 18.6	1.135	21	21 2 30.72	2.5011	21 42 41.8	8.966
22	19 3 16.39	2.5364	25 47 5.5	1.301	22	21 5 0.70	2.4983	21 33 39.4	9.115
23	19 5 48.63	2.5381	S.25 45 42.5	1.467	23	21 7 30.51	2.4953	S.21 24 28.0	9.263
	THURSDAY 2.					**SATURDAY 4.**			
0	19 8 20.96	2.5396	S.25 44 9.5	1.634	0	21 10 0.14	2.4923	S.21 15 7.8	9.410
1	19 10 53.38	2.5411	25 42 26.5	1.801	1	21 12 29.59	2.4893	21 5 38.8	9.556
2	19 13 25.89	2.5425	25 40 33.4	1.968	2	21 14 58.86	2.4863	20 56 1.1	9.700
3	19 15 58.48	2.5437	25 38 30.3	2.136	3	21 17 27.95	2.4832	20 46 14.8	9.843
4	19 18 31.14	2.5448	25 36 17.1	2.303	4	21 19 56.85	2.4801	20 36 19.9	9.986
5	19 21 3.86	2.5458	25 33 53.9	2.471	5	21 22 25.56	2.4769	20 26 16.5	10.127
6	19 23 36.64	2.5467	25 31 20.6	2.639	6	21 24 54.08	2.4737	20 16 4.6	10.267
7	19 26 9.47	2.5475	25 28 37.2	2.807	7	21 27 22.40	2.4704	20 5 44.4	10.406
8	19 28 42.34	2.5482	25 25 43.8	2.974	8	21 29 50.52	2.4671	19 55 15.9	10.544
9	19 31 15.25	2.5487	25 22 40.3	3.142	9	21 32 18.45	2.4638	19 44 39.1	10.681
10	19 33 48.19	2.5492	25 19 26.7	3.311	10	21 34 46.18	2.4604	19 33 54.2	10.816
11	19 36 21.15	2.5495	25 16 3.0	3.479	11	21 37 13.70	2.4569	19 23 1.2	10.950
12	19 38 54.13	2.5497	25 12 29.2	3.647	12	21 39 41.01	2.4535	19 12 0.2	11.082
13	19 41 27.12	2.5498	25 8 45.4	3.814	13	21 42 8.12	2.4501	19 0 51.3	11.213
14	19 44 0.11	2.5497	25 4 51.5	3.982	14	21 44 35.02	2.4466	18 49 34.6	11.343
15	19 46 33.09	2.5496	25 0 47.5	4.150	15	21 47 1.71	2.4431	18 38 10.1	11.472
16	19 49 6.06	2.5494	24 56 33.5	4.317	16	21 49 28.19	2.4396	18 26 38.0	11.598
17	19 51 39.02	2.5491	24 52 9.5	4.484	17	21 51 54.46	2.4360	18 14 58.3	11.724
18	19 54 11.95	2.5486	24 47 35.4	4.651	18	21 54 20.51	2.4324	18 3 11.1	11.848
19	19 56 44.85	2.5481	24 42 51.3	4.818	19	21 56 46.35	2.4289	17 51 16.5	11.972
20	19 59 17.72	2.5474	24 37 57.2	4.984	20	21 59 11.98	2.4253	17 39 14.5	12.093
21	20 1 50.54	2.5466	24 32 53.2	5.150	21	22 1 37.39	2.4217	17 27 5.3	12.213
22	20 4 23.31	2.5458	24 27 39.2	5.316	22	22 4 2.59	2.4182	17 14 48.9	12.332
23	20 6 56.03	2.5449	24 22 15.3	5.482	23	22 6 27.57	2.4146	17 2 25.4	12.449
24	20 9 28.70	2.5439	S.24 16 41.4	5.647	24	22 8 52.34	2.4110	S.16 49 55.0	12.564

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 8 52.34	2.4110	S. 16 49 55.0	12.564	0	0 0 49.54	2.2679	S. 5 5 24.8	16.108
1	22 11 16.89	2.4073	16 37 17.7	12.678	1	0 3 5.56	2.2661	4 49 17.4	16.137
2	22 13 41.22	2.4037	16 24 33.6	12.791	2	0 5 21.47	2.2643	4 33 8.3	16.165
3	22 16 5.34	2.4002	16 11 42.8	12.902	3	0 7 37.27	2.2625	4 16 57.6	16.191
4	22 18 29.24	2.3966	15 58 45.4	13.011	4	0 9 52.97	2.2608	4 0 45.4	16.214
5	22 20 52.93	2.3931	15 45 41.5	13.118	5	0 12 8.57	2.2592	3 44 31.9	16.236
6	22 23 16.41	2.3895	15 32 31.2	13.224	6	0 14 24.08	2.2577	3 28 17.1	16.256
7	22 25 39.67	2.3859	15 19 14.6	13.328	7	0 16 39.49	2.2562	3 12 1.2	16.273
8	22 28 2.72	2.3823	15 5 51.8	13.432	8	0 18 54.82	2.2547	2 55 44.3	16.289
9	22 30 25.55	2.3787	14 52 22.8	13.533	9	0 21 10.06	2.2533	2 39 26.5	16.303
10	22 32 48.17	2.3752	14 38 47.8	13.633	10	0 23 25.22	2.2520	2 23 7.9	16.316
11	22 35 10.58	2.3718	14 25 6.9	13.731	11	0 25 40.30	2.2508	2 6 48.6	16.327
12	22 37 32.79	2.3684	14 11 20.1	13.827	12	0 27 55.31	2.2496	1 50 28.7	16.335
13	22 39 54.79	2.3649	13 57 27.6	13.922	13	0 30 10.25	2.2485	1 34 8.4	16.341
14	22 42 16.58	2.3614	13 43 29.5	14.014	14	0 32 25.13	2.2474	1 17 47.8	16.346
15	22 44 38.16	2.3580	13 29 25.9	14.105	15	0 34 39.94	2.2463	1 1 26.9	16.349
16	22 46 59.54	2.3546	13 15 16.9	14.195	16	0 36 54.69	2.2454	0 45 5.9	16.350
17	22 49 20.72	2.3512	13 1 2.5	14.283	17	0 39 9.39	2.2446	0 28 44.9	16.349
18	22 51 41.69	2.3479	12 46 42.9	14.369	18	0 41 24.04	2.2438	S. 0 12 24.0	16.347
19	22 54 2.47	2.3447	12 32 18.2	14.453	19	0 43 38.64	2.2430	N. 0 3 56.7	16.342
20	22 56 23.05	2.3414	12 17 48.5	14.536	20	0 45 53.20	2.2423	0 20 17.1	16.336
21	22 58 43.44	2.3382	12 3 13.9	14.617	21	0 48 7.72	2.2417	0 36 37.0	16.327
22	23 1 3.63	2.3349	11 48 34.5	14.696	22	0 50 22.20	2.2411	0 52 56.4	16.317
23	23 3 23.63	2.3318	S. 11 33 50.5	14.772	23	0 52 36.65	2.2406	N. 1 9 15.1	16.305
	MONDAY 6.					WEDNESDAY 8.			
0	23 5 43.45	2.3287	S. 11 19 1.9	14.848	0	0 54 51.07	2.2402	N. 1 25 33.0	16.291
1	23 8 3.08	2.3257	11 4 8.8	14.922	1	0 57 5.47	2.2398	1 41 50.0	16.276
2	23 10 22.53	2.3226	10 49 11.3	14.993	2	0 59 19.85	2.2394	1 58 6.1	16.259
3	23 12 41.79	2.3196	10 34 9.6	15.063	3	1 1 34.20	2.2391	2 14 21.1	16.240
4	23 15 0.88	2.3167	10 19 3.7	15.132	4	1 3 48.54	2.2389	2 30 34.9	16.218
5	23 17 19.79	2.3138	10 3 53.8	15.198	5	1 6 2.87	2.2387	2 46 47.3	16.195
6	23 19 38.53	2.3109	9 48 40.0	15.262	6	1 8 17.19	2.2387	3 2 58.3	16.171
7	23 21 57.10	2.3081	9 33 22.4	15.325	7	1 10 31.51	2.2387	3 19 7.8	16.144
8	23 24 15.50	2.3053	9 18 1.0	15.387	8	1 12 45.83	2.2387	3 35 15.6	16.116
9	23 26 33.73	2.3025	9 2 36.0	15.446	9	1 15 0.15	2.2387	3 51 21.7	16.086
10	23 28 51.80	2.2999	8 47 7.5	15.503	10	1 17 14.48	2.2389	4 7 25.9	16.054
11	23 31 9.72	2.2973	8 31 35.6	15.558	11	1 19 28.82	2.2392	4 23 28.2	16.021
12	23 33 27.48	2.2947	8 16 0.5	15.612	12	1 21 43.18	2.2394	4 39 28.4	15.985
13	23 35 45.08	2.2922	8 0 22.2	15.663	13	1 23 57.55	2.2397	4 55 26.4	15.947
14	23 38 2.54	2.2898	7 44 40.9	15.713	14	1 26 11.94	2.2401	5 11 22.1	15.909
15	23 40 19.85	2.2873	7 28 56.6	15.762	15	1 28 26.36	2.2406	5 27 15.5	15.869
16	23 42 37.01	2.2849	7 13 9.5	15.807	16	1 30 40.81	2.2411	5 43 6.4	15.827
17	23 44 54.03	2.2826	6 57 19.7	15.851	17	1 32 55.29	2.2416	5 58 54.7	15.782
18	23 47 10.92	2.2803	6 41 27.4	15.893	18	1 35 9.80	2.2421	6 14 40.3	15.737
19	23 49 27.67	2.2781	6 25 32.6	15.934	19	1 37 24.34	2.2427	6 30 23.1	15.689
20	23 51 44.29	2.2760	6 9 35.3	15.973	20	1 39 38.92	2.2434	6 46 3.0	15.640
21	23 54 0.79	2.2739	5 53 35.8	16.010	21	1 41 53.55	2.2442	7 1 39.9	15.589
22	23 56 17.16	2.2718	5 37 34.1	16.045	22	1 44 8.23	2.2451	7 17 13.7	15.537
23	23 58 33.41	2.2698	5 21 30.4	16.078	23	1 46 22.96	2.2459	7 32 44.3	15.482
24	0 0 49.51	2.2679	S. 5 5 24.8	16.108	24	1 48 37.74	2.2468	N. 7 48 11.5	15.426

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 48 37.74	2.2468	N. 7 48 11.5	15.425	0	3 38 11.88	2.3268	N.18 35 25.6	11.020
1	1 50 52.58	2.2477	8 3 35.3	15.368	1	3 40 31.54	2.3287	18 46 23.2	10.898
2	1 53 7.47	2.2487	8 18 55.7	15.310	2	3 42 51.32	2.3306	18 57 13.4	10.775
3	1 55 22.42	2.2497	8 34 12.5	15.249	3	3 45 11.21	2.3324	19 7 56.2	10.651
4	1 57 37.44	2.2508	8 49 25.6	15.187	4	3 47 31.21	2.3343	19 18 31.5	10.527
5	1 59 52.52	2.2519	9 4 34.9	15.123	5	3 49 51.32	2.3362	19 28 59.4	10.402
6	2 2 7.67	2.2532	9 19 40.3	15.057	6	3 52 11.55	2.3380	19 39 19.7	10.275
7	2 4 22.90	2.2544	9 34 41.7	14.989	7	3 54 31.88	2.3397	19 49 32.4	10.147
8	2 6 38.20	2.2556	9 49 39.0	14.921	8	3 56 52.32	2.3415	19 59 37.4	10.018
9	2 8 53.57	2.2568	10 4 32.2	14.851	9	3 59 12.86	2.3432	20 9 34.6	9.888
10	2 11 9.02	2.2582	10 19 21.1	14.778	10	4 1 33.50	2.3449	20 19 24.0	9.758
11	2 13 24.56	2.2597	10 34 5.6	14.705	11	4 3 54.25	2.3466	20 29 5.6	9.628
12	2 15 40.18	2.2611	10 48 45.7	14.630	12	4 6 15.10	2.3483	20 38 39.4	9.497
13	2 17 55.89	2.2625	11 3 21.2	14.553	13	4 8 36.05	2.3499	20 48 5.2	9.364
14	2 20 11.68	2.2639	11 17 52.1	14.476	14	4 10 57.09	2.3514	20 57 23.1	9.231
15	2 22 27.56	2.2655	11 32 18.3	14.396	15	4 13 18.22	2.3529	21 6 33.0	9.097
16	2 24 43.54	2.2671	11 46 39.6	14.314	16	4 15 39.44	2.3544	21 15 34.8	8.962
17	2 26 59.61	2.2687	12 0 56.0	14.232	17	4 18 0.75	2.3559	21 24 28.5	8.827
18	2 29 15.78	2.2703	12 15 7.5	14.149	18	4 20 22.15	2.3573	21 33 14.1	8.692
19	2 31 32.05	2.2720	12 29 13.9	14.063	19	4 22 43.63	2.3587	21 41 51.5	8.555
20	2 33 48.42	2.2736	12 43 15.1	13.976	20	4 25 5.19	2.3600	21 50 20.7	8.418
21	2 36 4.88	2.2753	12 57 11.0	13.887	21	4 27 26.83	2.3614	21 58 41.7	8.281
22	2 38 21.45	2.2771	13 11 1.6	13.798	22	4 29 48.55	2.3627	22 6 54.4	8.142
23	2 40 38.13	2.2788	N.13 24 46.8	13.707	23	4 32 10.35	2.3639	N.22 14 58.8	8.003
	FRIDAY 10.					**SUNDAY 12.**			
0	2 42 54.91	2.2806	N.13 38 26.4	13.614	0	4 34 32.22	2.3650	N.22 22 54.8	7.863
1	2 45 11.80	2.2824	13 52 0.4	13.520	1	4 36 54.15	2.3661	22 30 42.4	7.723
2	2 47 28.80	2.2842	14 5 28.8	13.426	2	4 39 16.15	2.3672	22 38 21.6	7.583
3	2 49 45.91	2.2861	14 18 51.5	13.329	3	4 41 38.21	2.3682	22 45 52.4	7.442
4	2 52 3.13	2.2879	14 32 8.3	13.231	4	4 44 0.33	2.3691	22 53 14.7	7.301
5	2 54 20.46	2.2898	14 45 19.2	13.132	5	4 46 22.50	2.3699	23 0 28.5	7.158
6	2 56 37.91	2.2917	14 58 24.2	13.032	6	4 48 44.72	2.3707	23 7 33.7	7.016
7	2 58 55.47	2.2936	15 11 23.1	12.930	7	4 51 6.99	2.3715	23 14 30.4	6.873
8	3 1 13.14	2.2955	15 24 15.8	12.827	8	4 53 29.30	2.3723	23 21 18.5	6.731
9	3 3 30.93	2.2975	15 37 2.3	12.723	9	4 55 51.66	2.3730	23 27 58.1	6.587
10	3 5 48.84	2.2994	15 49 42.5	12.618	10	4 58 14.06	2.3736	23 34 29.0	6.443
11	3 8 6.86	2.3013	16 2 16.4	12.511	11	5 0 36.49	2.3740	23 40 51.3	6.299
12	3 10 25.00	2.3033	16 14 43.8	12.402	12	5 2 58.94	2.3744	23 47 4.9	6.154
13	3 12 43.26	2.3053	16 27 4.7	12.293	13	5 5 21.42	2.3748	23 53 9.8	6.009
14	3 15 1.64	2.3072	16 39 19.0	12.183	14	5 7 43.92	2.3752	23 59 6.0	5.865
15	3 17 20.13	2.3092	16 51 26.7	12.072	15	5 10 6.44	2.3755	24 4 53.6	5.720
16	3 19 38.74	2.3112	17 3 27.7	11.960	16	5 12 28.98	2.3757	24 10 32.4	5.574
17	3 21 57.47	2.3132	17 15 21.9	11.846	17	5 14 51.53	2.3758	24 16 2.5	5.429
18	3 24 16.32	2.3152	17 27 9.2	11.731	18	5 17 14.08	2.3758	24 21 23.9	5.283
19	3 26 35.29	2.3171	17 38 49.6	11.615	19	5 19 36.63	2.3758	24 26 36.5	5.137
20	3 28 54.37	2.3190	17 50 23.0	11.498	20	5 21 59.18	2.3758	24 31 40.3	4.990
21	3 31 13.57	2.3210	18 1 49.4	11.381	21	5 24 21.73	2.3757	24 36 35.3	4.844
22	3 33 32.89	2.3230	18 13 8.7	11.262	22	5 26 44.26	2.3754	24 41 21.6	4.698
23	3 35 52.33	2.3249	18 24 20.8	11.141	23	5 29 6.78	2.3751	24 45 59.1	4.552
24	3 38 11.88	2.3268	N.18 35 25.6	11.020	24	5 31 29.28	2.3748	N.24 50 27.8	4.405

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 31 29.28	2.3748	N.24 50 27.8	4.406
1	5 33 51.76	2.3744	24 54 47.7	4.258
2	5 36 14.21	2.3738	24 58 58.8	4.112
3	5 38 36.62	2.3732	25 3 1.2	3.966
4	5 40 58.99	2.3725	25 6 54.8	3.819
5	5 43 21.32	2.3717	25 10 39.5	3.672
6	5 45 43.60	2.3709	25 14 15.4	3.526
7	5 48 5.83	2.3700	25 17 42.6	3.380
8	5 50 28.00	2.3691	25 21 1.0	3.233
9	5 52 50.12	2.3681	25 24 10.6	3.087
10	5 55 12.17	2.3669	25 27 11.4	2.941
11	5 57 34.15	2.3657	25 30 3.5	2.795
12	5 59 56.06	2.3645	25 32 46.8	2.649
13	6 2 17.89	2.3632	25 35 21.4	2.504
14	6 4 39.63	2.3617	25 37 47.3	2.358
15	6 7 1.29	2.3602	25 40 4.4	2.212
16	6 9 22.86	2.3586	25 42 12.8	2.068
17	6 11 44.33	2.3569	25 44 12.6	1.924
18	6 14 5.69	2.3552	25 46 3.7	1.779
19	6 16 26.95	2.3534	25 47 46.1	1.635
20	6 18 48.10	2.3515	25 49 19.9	1.492
21	6 21 9.13	2.3495	25 50 45.1	1.348
22	6 23 30.04	2.3475	25 52 1.7	1.205
23	6 25 50.83	2.3454	N.25 53 9.7	1.062

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 28 11.49	2.3432	N.25 54 9.1	0.919
1	6 30 32.01	2.3409	25 55 0.0	0.777
2	6 32 52.40	2.3386	25 55 42.4	0.636
3	6 35 12.65	2.3363	25 56 16.3	0.494
4	6 37 32.75	2.3338	25 56 41.7	0.353
5	6 39 52.70	2.3313	25 56 58.7	0.213
6	6 42 12.50	2.3286	25 57 7.3	+ 0.074
7	6 44 32.14	2.3259	25 57 7.6	− 0.065
8	6 46 51.61	2.3232	25 56 59.5	0.205
9	6 49 10.92	2.3204	25 56 43.0	0.344
10	6 51 30.06	2.3175	25 56 18.2	0.482
11	6 53 49.02	2.3146	25 55 45.2	0.618
12	6 56 7.81	2.3117	25 55 4.0	0.755
13	6 58 26.42	2.3086	25 54 14.6	0.892
14	7 0 44.84	2.3054	25 53 17.0	1.028
15	7 3 3.06	2.3021	25 52 11.3	1.163
16	7 5 21.09	2.2988	25 50 57.5	1.298
17	7 7 38.92	2.2956	25 49 35.6	1.432
18	7 9 56.56	2.2923	25 48 5.7	1.565
19	7 12 13.99	2.2889	25 46 27.8	1.697
20	7 14 31.21	2.2854	25 44 42.0	1.829
21	7 16 48.23	2.2818	25 42 48.3	1.961
22	7 19 5.03	2.2782	25 40 46.7	2.092
23	7 21 21.61	2.2745	25 38 37.3	2.222
24	7 23 37.97	2.2708	N.25 36 20.1	2.351

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 23 37.97	2.2708	N.25 36 20.1	2.351
1	7 25 54.11	2.2671	25 33 55.2	2.480
2	7 28 10.02	2.2633	25 31 22.5	2.609
3	7 30 25.70	2.2594	25 28 42.1	2.737
4	7 32 41.15	2.2556	25 25 54.1	2.863
5	7 34 56.37	2.2517	25 22 58.6	2.988
6	7 37 11.35	2.2477	25 19 55.5	3.114
7	7 39 26.09	2.2437	25 16 44.9	3.239
8	7 41 40.59	2.2396	25 13 26.8	3.363
9	7 43 54.84	2.2355	25 10 1.3	3.486
10	7 46 8.85	2.2314	25 6 28.5	3.608
11	7 48 22.61	2.2273	25 2 48.4	3.730
12	7 50 36.12	2.2231	24 59 0.9	3.852
13	7 52 49.38	2.2188	24 55 6.2	3.971
14	7 55 2.38	2.2145	24 51 4.4	4.090
15	7 57 15.12	2.2102	24 46 55.4	4.209
16	7 59 27.61	2.2059	24 42 39.3	4.327
17	8 1 39.83	2.2015	24 38 16.2	4.444
18	8 3 51.79	2.1972	24 33 46.0	4.561
19	8 6 3.49	2.1928	24 29 8.9	4.676
20	8 8 14.92	2.1883	24 24 24.9	4.791
21	8 10 26.09	2.1839	24 19 34.0	4.905
22	8 12 36.99	2.1794	24 14 36.3	5.018
23	8 14 47.62	2.1749	N.24 9 31.9	5.130

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 16 57.98	2.1704	N.24 4 20.7	5.242
1	8 19 8.07	2.1659	23 59 2.8	5.352
2	8 21 17.89	2.1614	23 53 38.4	5.462
3	8 23 27.44	2.1568	23 48 7.4	5.571
4	8 25 36.71	2.1522	23 42 29.9	5.679
5	8 27 45.71	2.1477	23 36 45.9	5.787
6	8 29 54.44	2.1432	23 30 55.5	5.893
7	8 32 2.89	2.1386	23 24 58.7	5.999
8	8 34 11.07	2.1340	23 18 55.6	6.104
9	8 36 18.97	2.1293	23 12 46.2	6.208
10	8 38 26.59	2.1247	23 6 30.6	6.312
11	8 40 33.94	2.1202	23 0 8.8	6.414
12	8 42 41.01	2.1156	22 53 40.9	6.516
13	8 44 47.81	2.1110	22 47 6.9	6.617
14	8 46 54.33	2.1063	22 40 26.9	6.717
15	8 49 0.57	2.1017	22 33 40.9	6.816
16	8 51 6.54	2.0972	22 26 49.0	6.914
17	8 53 12.23	2.0926	22 19 51.2	7.012
18	8 55 17.65	2.0880	22 12 47.6	7.108
19	8 57 22.79	2.0834	22 5 38.2	7.204
20	8 59 27.66	2.0788	21 58 23.1	7.299
21	9 1 32.25	2.0742	21 51 2.3	7.393
22	9 3 36.57	2.0697	21 43 35.9	7.487
23	9 5 40.62	2.0652	21 36 3.8	7.581
24	9 7 44.40	2.0607	N.21 28 26.2	7.673

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 7 44.40	2.0607	N.21 28 26.2	7.672
1	9 9 47.90	2.0562	21 20 43.1	7.763
2	9 11 51.14	2.0517	21 12 54.6	7.853
3	9 13 54.11	2.0472	21 5 0.7	7.943
4	9 15 56.81	2.0428	20 57 1.4	8.031
5	9 17 59.25	2.0384	20 48 56.9	8.118
6	9 20 1.42	2.0340	20 40 47.2	8.205
7	9 22 3.33	2.0296	20 32 32.3	8.292
8	9 24 4.97	2.0252	20 24 12.2	8.378
9	9 26 6.35	2.0208	20 15 46.9	8.463
10	9 28 7.47	2.0165	20 7 16.6	8.546
11	9 30 8.33	2.0122	19 58 41.4	8.629
12	9 32 8.93	2.0079	19 50 1.2	8.711
13	9 34 9.28	2.0037	19 41 16.1	8.792
14	9 36 9.37	1.9994	19 32 26.1	8.873
15	9 38 9.21	1.9952	19 23 31.3	8.953
16	9 40 8.80	1.9911	19 14 31.8	9.032
17	9 42 8.14	1.9870	19 5 27.5	9.111
18	9 44 7.24	1.9829	18 56 18.5	9.188
19	9 46 6.09	1.9788	18 47 4.9	9.264
20	9 48 4.70	1.9747	18 37 46.8	9.340
21	9 50 3.06	1.9707	18 28 24.1	9.416
22	9 52 1.19	1.9668	18 18 56.9	9.490
23	9 53 59.08	1.9628	N.18 9 25.3	9.563

SATURDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 55 56.73	1.9589	N.17 59 49.3	9.636
1	9 57 54.15	1.9551	17 50 8.9	9.708
2	9 59 51.34	1.9513	17 40 24.3	9.779
3	10 1 48.31	1.9476	17 30 35.4	9.850
4	10 3 45.05	1.9438	17 20 42.3	9.919
5	10 5 41.56	1.9400	17 10 45.1	9.988
6	10 7 37.85	1.9363	17 0 43.7	10.057
7	10 9 33.92	1.9327	16 50 38.3	10.134
8	10 11 29.78	1.9292	16 40 28.9	10.191
9	10 13 25.42	1.9256	16 30 15.4	10.257
10	10 15 20.85	1.9221	16 19 58.0	10.322
11	10 17 16.07	1.9187	16 9 36.7	10.387
12	10 19 11.09	1.9153	15 59 11.6	10.450
13	10 21 5.91	1.9119	15 48 42.7	10.513
14	10 23 0.52	1.9085	15 38 10.0	10.576
15	10 24 54.93	1.9052	15 27 33.6	10.637
16	10 26 49.15	1.9020	15 16 53.6	10.698
17	10 28 43.17	1.8988	15 6 9.9	10.758
18	10 30 37.00	1.8957	14 55 22.6	10.817
19	10 32 30.65	1.8926	14 44 31.8	10.876
20	10 34 24.11	1.8895	14 33 37.5	10.934
21	10 36 17.39	1.8865	14 22 39.7	10.992
22	10 38 10.49	1.8836	14 11 38.5	11.048
23	10 40 3.42	1.8807	14 0 33.9	11.104
24	10 41 56.17	1.8778	N.13 49 26.0	11.159

SUNDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 41 56.17	1.8778	N.13 49 26.0	11.159
1	10 43 48.75	1.8750	13 38 14.8	11.213
2	10 45 41.17	1.8722	13 27 0.4	11.266
3	10 47 33.42	1.8695	13 15 42.8	11.319
4	10 49 25.51	1.8668	13 4 22.1	11.372
5	10 51 17.44	1.8642	12 52 58.2	11.424
6	10 53 9.22	1.8617	12 41 31.2	11.475
7	10 55 0.84	1.8592	12 30 1.2	11.524
8	10 56 52.32	1.8567	12 18 28.3	11.573
9	10 58 43.65	1.8543	12 6 52.4	11.622
10	11 0 34.84	1.8520	11 55 13.6	11.671
11	11 2 25.89	1.8497	11 43 31.9	11.718
12	11 4 16.80	1.8474	11 31 47.4	11.765
13	11 6 7.58	1.8452	11 20 0.1	11.811
14	11 7 58.23	1.8431	11 8 10.1	11.856
15	11 9 48.75	1.8410	10 56 17.4	11.900
16	11 11 39.15	1.8390	10 44 22.1	11.944
17	11 13 29.43	1.8371	10 32 24.2	11.988
18	11 15 19.60	1.8352	10 20 23.6	12.031
19	11 17 9.65	1.8333	10 8 20.5	12.072
20	11 18 59.59	1.8314	9 56 15.0	12.113
21	11 20 49.42	1.8297	9 44 7.0	12.153
22	11 22 39.15	1.8280	9 31 56.6	12.192
23	11 24 28.78	1.8264	N. 9 19 43.9	12.232

MONDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 26 18.32	1.8248	N. 9 7 28.8	12.271
1	11 28 7.76	1.8232	8 55 11.4	12.308
2	11 29 57.11	1.8218	8 42 51.8	12.344
3	11 31 46.38	1.8205	8 30 30.1	12.380
4	11 33 35.57	1.8191	8 18 6.2	12.416
5	11 35 24.67	1.8177	8 5 40.2	12.452
6	11 37 13.69	1.8164	7 53 12.0	12.486
7	11 39 2.64	1.8153	7 40 41.8	12.519
8	11 40 51.53	1.8142	7 28 9.7	12.552
9	11 42 40.35	1.8132	7 15 35.6	12.584
10	11 44 29.11	1.8122	7 2 59.6	12.615
11	11 46 17.81	1.8112	6 50 21.8	12.646
12	11 48 6.45	1.8103	6 37 42.1	12.677
13	11 49 55.04	1.8094	6 25 0.6	12.706
14	11 51 43.58	1.8087	6 12 17.4	12.733
15	11 53 32.08	1.8080	5 59 32.6	12.761
16	11 55 20.54	1.8073	5 46 46.1	12.788
17	11 57 8.96	1.8067	5 33 58.0	12.816
18	11 58 57.35	1.8062	5 21 8.2	12.842
19	12 0 45.71	1.8057	5 8 16.9	12.867
20	12 2 34.04	1.8052	4 55 24.2	12.891
21	12 4 22.34	1.8048	4 42 30.0	12.915
22	12 6 10.62	1.8046	4 29 34.4	12.938
23	12 7 58.89	1.8044	4 16 37.5	12.960
24	12 9 47.15	1.8043	N. 4 3 39.2	12.982

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	TUESDAY 21.					**THURSDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 9 47.15	1.8043	N. 4 3 39.2	12.982	0	13 37 21.07	1.8681	S. 6 30 5.6	13.119
1	12 11 35.40	1.8042	3 50 39.7	13.003	1	13 39 13.24	1.8709	6 43 12.2	13.101
2	12 13 23.65	1.8041	3 37 38.9	13.023	2	13 41 5.58	1.8737	6 56 17.7	13.082
3	12 15 11.89	1.8041	3 24 36.9	13.042	3	13 42 58.09	1.8767	7 9 22.1	13.063
4	12 17 0.14	1.8042	3 11 33.8	13.061	4	13 44 50.78	1.8798	7 22 25.3	13.043
5	12 18 48.39	1.8043	2 58 29.6	13.079	5	13 46 43.66	1.8829	7 35 27.3	13.022
6	12 20 36.65	1.8045	2 45 24.4	13.096	6	13 48 36.73	1.8861	7 48 27.9	12.999
7	12 22 24.93	1.8047	2 32 18.1	13.113	7	13 50 29.99	1.8893	8 1 27.2	12.976
8	12 24 13.22	1.8050	2 19 10.8	13.128	8	13 52 23.44	1.8924	8 14 25.1	12.952
9	12 26 1.53	1.8054	2 6 2.7	13.143	9	13 54 17.08	1.8957	8 27 21.5	12.927
10	12 27 49.87	1.8058	1 52 53.7	13.158	10	13 56 10.92	1.8991	8 40 16.3	12.901
11	12 29 38.23	1.8062	1 39 43.8	13.172	11	13 58 4.97	1.9026	8 53 9.6	12.874
12	12 31 26.62	1.8068	1 26 33.1	13.184	12	13 59 59.23	1.9061	9 6 1.2	12.846
13	12 33 15.05	1.8075	1 13 21.7	13.196	13	14 1 53.70	1.9097	9 18 51.1	12.817
14	12 35 3.52	1.8082	1 0 9.6	13.207	14	14 3 48.39	1.9133	9 31 39.3	12.787
15	12 36 52.03	1.8089	0 46 56.8	13.218	15	14 5 43.29	1.9169	9 44 25.6	12.756
16	12 38 40.59	1.8097	0 33 43.4	13.228	16	14 7 38.42	1.9207	9 57 10.0	12.724
17	12 40 29.20	1.8106	0 20 29.4	13.237	17	14 9 33.77	1.9244	10 9 52.5	12.692
18	12 42 17.86	1.8115	N. 0 7 14.9	13.246	18	14 11 29.35	1.9282	10 22 33.0	12.658
19	12 44 6.58	1.8125	S. 0 6 0.1	13.253	19	14 13 25.16	1.9322	10 35 11.4	12.623
20	12 45 55.36	1.8135	0 19 15.5	13.260	20	14 15 21.21	1.9362	10 47 47.7	12.587
21	12 47 44.20	1.8146	0 32 31.3	13.266	21	14 17 17.50	1.9402	11 0 21.8	12.549
22	12 49 33.11	1.8158	0 45 47.4	13.271	22	14 19 14.03	1.9442	11 12 53.6	12.511
23	12 51 22.10	1.8171	S. 0 59 3.8	13.276	23	14 21 10.81	1.9484	S. 11 25 23.1	12.472
	WEDNESDAY 22.					**FRIDAY 24.**			
0	12 53 11.16	1.8184	S. 1 12 20.5	13.280	0	14 23 7.84	1.9526	S. 11 37 50.3	12.432
1	12 55 0.30	1.8198	1 25 37.4	13.282	1	14 25 5.12	1.9568	11 50 15.0	12.391
2	12 56 49.53	1.8212	1 38 54.4	13.284	2	14 27 2.66	1.9611	12 2 37.2	12.348
3	12 58 38.84	1.8226	1 52 11.5	13.286	3	14 29 0.45	1.9654	12 14 56.8	12.305
4	13 0 28.24	1.8242	2 5 28.7	13.286	4	14 30 58.50	1.9698	12 27 13.8	12.261
5	13 2 17.74	1.8257	2 18 45.8	13.285	5	14 32 56.82	1.9742	12 39 28.1	12.215
6	13 4 7.33	1.8273	2 32 2.9	13.284	6	14 34 55.41	1.9787	12 51 39.6	12.168
7	13 5 57.02	1.8291	2 45 19.9	13.282	7	14 36 54.27	1.9833	13 3 48.3	12.121
8	13 7 46.82	1.8310	2 58 36.7	13.279	8	14 38 53.41	1.9879	13 15 54.1	12.072
9	13 9 36.74	1.8329	3 11 53.4	13.276	9	14 40 52.82	1.9925	13 27 56.9	12.021
10	13 11 26.77	1.8348	3 25 9.8	13.271	10	14 42 52.51	1.9972	13 39 56.6	11.970
11	13 13 16.91	1.8367	3 38 25.9	13.266	11	14 44 52.49	2.0020	13 51 53.3	11.918
12	13 15 7.17	1.8388	3 51 41.7	13.260	12	14 46 52.75	2.0068	14 3 46.8	11.865
13	13 16 57.56	1.8409	4 4 57.1	13.253	13	14 48 53.30	2.0116	14 15 37.1	11.811
14	13 18 48.08	1.8430	4 18 12.0	13.245	14	14 50 54.14	2.0165	14 27 24.1	11.755
15	13 20 38.72	1.8452	4 31 26.5	13.237	15	14 52 55.28	2.0214	14 39 7.7	11.698
16	13 22 29.50	1.8475	4 44 40.4	13.227	16	14 54 56.71	2.0264	14 50 47.8	11.640
17	13 24 20.42	1.8498	4 57 53.7	13.216	17	14 56 58.45	2.0315	15 2 24.5	11.582
18	13 26 11.48	1.8522	5 11 6.3	13.204	18	14 59 0.49	2.0366	15 13 57.6	11.522
19	13 28 2.69	1.8547	5 24 18.2	13.192	19	15 1 2.84	2.0417	15 25 27.1	11.460
20	13 29 54.05	1.8573	5 37 29.4	13.180	20	15 3 5.49	2.0468	15 36 52.8	11.397
21	13 31 45.57	1.8599	5 50 39.8	13.166	21	15 5 8.45	2.0519	15 48 14.7	11.333
22	13 33 37.24	1.8626	6 3 49.3	13.151	22	15 7 11.72	2.0572	15 59 32.8	11.268
23	13 35 29.07	1.8653	6 16 57.9	13.136	23	15 9 15.31	2.0625	16 10 46.9	11.202
24	13 37 21.07	1.8681	S. 6 30 5.6	13.119	24	15 11 19.22	2.0678	S. 16 21 57.0	11.135

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					**MONDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 11 19.22	2.0678	S. 16 21 57.0	11.135	0	16 57 6.00	2.3407	S. 23 35 26.4	6.450
1	15 13 23.45	2.0732	16 33 3.1	11.067	1	16 59 26.60	2.3460	23 41 49.6	6.322
2	15 15 28.00	2.0785	16 44 5.0	10.997	2	17 1 47.52	2.3513	23 48 5.0	6.193
3	15 17 32.87	2.0839	16 55 2.7	10.926	3	17 4 8.76	2.3566	23 54 12.7	6.063
4	15 19 38.07	2.0893	17 5 56.1	10.853	4	17 6 30.31	2.3619	24 0 12.6	5.932
5	15 21 43.59	2.0947	17 16 45.1	10.780	5	17 8 52.18	2.3671	24 6 4.6	5.800
6	15 23 49.44	2.1003	17 27 29.7	10.706	6	17 11 14.36	2.3722	24 11 48.6	5.667
7	15 25 55.63	2.1059	17 38 9.8	10.630	7	17 13 36.84	2.3772	24 17 24.6	5.533
8	15 28 2.15	2.1114	17 48 45.3	10.552	8	17 15 59.62	2.3822	24 22 52.5	5.398
9	15 30 9.00	2.1170	17 59 16.1	10.474	9	17 18 22.71	2.3872	24 28 12.3	5.262
10	15 32 16.19	2.1227	18 9 42.2	10.395	10	17 20 46.09	2.3921	24 33 23.9	5.123
11	15 34 23.72	2.1283	18 20 3.5	10.315	11	17 23 9.76	2.3969	24 38 27.1	4.984
12	15 36 31.59	2.1340	18 30 20.0	10.233	12	17 25 33.72	2.4017	24 43 22.0	4.845
13	15 38 39.80	2.1397	18 40 31.5	10.150	13	17 27 57.97	2.4064	24 48 8.5	4.705
14	15 40 48.35	2.1454	18 50 38.0	10.065	14	17 30 22.49	2.4109	24 52 46.6	4.564
15	15 42 57.25	2.1512	19 0 39.3	9.979	15	17 32 47.28	2.4154	24 57 16.2	4.422
16	15 45 6.49	2.1569	19 10 35.4	9.892	16	17 35 12.34	2.4199	25 1 37.2	4.278
17	15 47 16.08	2.1627	19 20 26.3	9.804	17	17 37 37.67	2.4243	25 5 49.5	4.133
18	15 49 26.02	2.1685	19 30 11.9	9.715	18	17 40 3.26	2.4287	25 9 53.1	3.988
19	15 51 36.30	2.1743	19 39 52.1	9.624	19	17 42 29.11	2.4329	25 13 48.0	3.842
20	15 53 46.93	2.1801	19 49 26.8	9.532	20	17 44 55.21	2.4370	25 17 34.1	3.694
21	15 55 57.91	2.1859	19 58 55.9	9.438	21	17 47 21.55	2.4410	25 21 11.3	3.546
22	15 58 9.24	2.1917	20 8 19.3	9.343	22	17 49 48.13	2.4450	25 24 39.6	3.397
23	16 0 20.92	2.1976	S. 20 17 37.1	9.248	23	17 52 14.95	2.4489	S. 25 27 59.0	3.248
	SUNDAY 26.					**TUESDAY 28.**			
0	16 2 32.95	2.2034	S. 20 26 49.1	9.151	0	17 54 42.00	2.4527	S. 25 31 9.4	3.097
1	16 4 45.33	2.2093	20 35 55.2	9.052	1	17 57 9.27	2.4564	25 34 10.7	2.946
2	16 6 58.07	2.2151	20 44 55.4	8.953	2	17 59 36.77	2.4601	25 37 2.9	2.794
3	16 9 11.15	2.2209	20 53 49.6	8.852	3	18 2 4.48	2.4636	25 39 46.0	2.642
4	16 11 24.58	2.2268	21 2 37.7	8.750	4	18 4 32.40	2.4670	25 42 19.9	2.488
5	16 13 38.37	2.2327	21 11 19.6	8.647	5	18 7 0.52	2.4702	25 44 44.6	2.334
6	16 15 52.51	2.2386	21 19 55.3	8.543	6	18 9 28.83	2.4734	25 47 0.0	2.179
7	16 18 7.00	2.2444	21 28 24.7	8.437	7	18 11 57.33	2.4766	25 49 6.1	2.023
8	16 20 21.83	2.2502	21 36 47.7	8.329	8	18 14 26.02	2.4797	25 51 2.8	1.867
9	16 22 37.02	2.2561	21 45 4.2	8.221	9	18 16 54.89	2.4826	25 52 50.2	1.711
10	16 24 52.56	2.2618	21 53 14.2	8.112	10	18 19 23.93	2.4854	25 54 28.1	1.553
11	16 27 8.44	2.2676	22 1 17.6	8.001	11	18 21 53.14	2.4882	25 55 56.5	1.395
12	16 29 24.67	2.2734	22 9 14.3	7.888	12	18 24 22.51	2.4907	25 57 15.5	1.237
13	16 31 41.25	2.2792	22 17 4.2	7.775	13	18 26 52.03	2.4932	25 58 24.9	1.077
14	16 33 58.17	2.2849	22 24 47.3	7.661	14	18 29 21.70	2.4956	25 59 24.7	0.917
15	16 36 15.44	2.2907	22 32 23.5	7.545	15	18 31 51.50	2.4979	26 0 15.0	0.757
16	16 38 33.05	2.2963	22 39 52.7	7.428	16	18 34 21.44	2.5001	26 0 55.6	0.597
17	16 40 51.00	2.3019	22 47 14.9	7.310	17	18 36 51.51	2.5021	26 1 26.6	0.437
18	16 43 9.28	2.3075	22 54 29.9	7.190	18	18 39 21.69	2.5040	26 1 48.0	0.276
19	16 45 27.90	2.3131	23 1 37.7	7.070	19	18 41 51.99	2.5058	26 1 59.7	− 0.114
20	16 47 46.86	2.3187	23 8 38.3	6.948	20	18 44 22.39	2.5075	26 2 1.6	+ 0.049
21	16 50 6.15	2.3242	23 15 31.5	6.825	21	18 46 52.89	2.5091	26 1 53.8	0.212
22	16 52 25.77	2.3297	23 22 17.3	6.701	22	18 49 23.48	2.5106	26 1 36.2	0.375
23	16 54 45.72	2.3352	23 28 55.6	6.576	23	18 51 54.16	2.5120	26 1 8.8	0.537
24	16 57 6.00	2.3407	S. 23 35 26.4	6.451	24	18 51 24.92	2.5132	S. 26 0 31.7	0.700

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 54 24.92	2.5139	S.26 0 31.7	0.700
1	18 56 55.75	2.5144	25 59 44.8	0.864
2	18 59 26.65	2.5154	25 58 48.0	1.028
3	19 1 57.60	2.5163	25 57 41.4	1.192
4	19 4 28.60	2.5171	25 56 25.0	1.356
5	19 6 59.65	2.5178	25 54 58.8	1.519
6	19 9 30.74	2.5184	25 53 22.7	1.683
7	19 12 1.86	2.5188	25 51 36.8	1.847
8	19 14 33.00	2.5191	25 49 41.0	2.012
9	19 17 4.15	2.5193	25 47 35.4	2.176
10	19 19 35.32	2.5195	25 45 19.9	2.340
11	19 22 6.49	2.5194	25 42 54.6	2.503
12	19 24 37.65	2.5193	25 40 19.5	2.667
13	19 27 8.80	2.5191	25 37 34.5	2.831
14	19 29 39.94	2.5188	25 34 39.7	2.995
15	19 32 11.06	2.5184	25 31 35.1	3.159
16	19 34 42.15	2.5178	25 28 20.6	3.322
17	19 37 13.20	2.5171	25 24 56.4	3.485
18	19 39 44.20	2.5163	25 21 22.4	3.648
19	19 42 15.15	2.5154	25 17 38.6	3.811
20	19 44 46.05	2.5145	25 13 45.1	3.974
21	19 47 16.89	2.5134	25 9 41.8	4.136
22	19 49 47.66	2.5122	25 5 28.8	4.297
23	19 52 18.36	2.5109	S.25 1 6.2	4.458

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 54 48.97	2.5094	S.24 56 33.9	4.619
1	19 57 19.49	2.5079	24 51 51.9	4.780
2	19 59 49.92	2.5064	24 47 0.3	4.939
3	20 2 20.26	2.5048	24 41 59.2	5.098
4	20 4 50.50	2.5031	24 36 48.5	5.258
5	20 7 20.63	2.5012	24 31 28.3	5.417
6	20 9 50.64	2.4992	24 25 58.5	5.575
7	20 12 20.53	2.4971	24 20 19.3	5.732
8	20 14 50.29	2.4950	24 14 30.7	5.888
9	20 17 19.93	2.4928	24 8 32.7	6.044
10	20 19 49.43	2.4905	24 2 25.4	6.200
11	20 22 18.79	2.4882	23 56 8.7	6.356
12	20 24 48.01	2.4857	23 49 42.7	6.510
13	20 27 17.08	2.4832	23 43 7.5	6.663
14	20 29 45.99	2.4805	23 36 23.2	6.815
15	20 32 14.74	2.4778	23 29 29.7	6.967
16	20 34 43.33	2.4751	23 22 27.1	7.118
17	20 37 11.75	2.4722	23 15 15.5	7.268
18	20 39 40.00	2.4693	23 7 54.9	7.418
19	20 42 8.07	2.4664	23 0 25.3	7.567
20	20 44 35.97	2.4635	22 52 46.8	7.715
21	20 47 3.69	2.4604	22 44 59.5	7.862
22	20 49 31.22	2.4573	22 37 3.1	8.007
23	20 51 58.56	2.4542	22 28 58.6	8.152
24	20 54 55.72	2.4510	S.22 20 45.1	8.297

FRIDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 54 55.72	2.4510	S.22 20 45.1	8.297

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	April	1	18	30.3
● New Moon		8	8	57.0
☽ First Quarter . . .		15	13	40.4
○ Full Moon		23	17	5.2

		d	h
☾ Perigee	April	6	22.2
☾ Apogee		18	23.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	69° 26′ 47″	2546	71° 6′ 56″	2533	72° 47′ 23″	2520	74° 28′ 9″	2505
	Antares	W.	23 39 39	2599	25 18 35	2577	26 58 1	2556	28 37 56	2537
	Venus	E.	57 45 26	2937	56 13 54	2924	54 42 5	2909	53 9 58	2895
	Fomalhaut	E.	61 47 26	2751	60 11 54	2745	58 36 14	2741	57 0 28	2737
	Sun	E.	99 38 49	2868	98 5 49	2852	96 32 29	2838	94 58 50	2823
2	Spica	W.	82 56 53	2436	84 39 37	2422	86 22 40	2408	88 6 3	2394
	Antares	W.	37 3 58	2449	38 46 23	2433	40 29 11	2417	42 12 22	2401
	Venus	E.	45 24 59	2828	43 51 7	2814	42 16 57	2800	40 42 29	2788
	Fomalhaut	E.	49 0 50	2735	47 24 56	2739	45 49 8	2746	44 13 29	2755
	Sun	E.	87 5 48	2749	85 30 13	2734	83 54 18	2719	82 18 4	2704
3	Spica	W.	96 47 56	2326	98 33 17	2313	100 18 58	2300	102 4 58	2287
	Antares	W.	50 53 48	2326	52 39 10	2311	54 24 53	2297	56 10 57	2283
	Venus	E.	32 46 7	2729	31 10 5	2719	29 33 50	2710	27 57 23	2702
	Sun	E.	74 11 56	2631	72 33 43	2616	70 55 10	2602	69 16 18	2588
4	Spica	W.	110 59 37	2226	112 47 26	2214	114 35 32	2203	116 23 55	2193
	Antares	W.	65 6 19	2217	66 54 21	2204	68 42 42	2192	70 31 21	2180
	Sun	E.	60 57 15	2522	59 16 32	2510	57 35 32	2497	55 54 14	2486
5	Antares	W.	79 38 48	2129	81 29 3	2120	83 19 32	2111	85 10 14	2103
	α Aquilæ	W.	43 37 11	4233	44 45 6	4085	45 55 22	3953	47 7 48	3834
	Sun	E.	47 23 56	2435	45 41 11	2426	43 58 13	2417	42 15 3	2411
6	Antares	W.	94 26 34	2072	96 18 17	2066	98 10 8	2062	100 2 5	2059
	α Aquilæ	W.	53 37 19	3391	54 59 46	3326	56 23 27	3268	57 48 16	3214
	Sun	E.	33 37 6	2387	31 53 12	2385	30 9 16	2385	28 25 20	2387
9	Sun	W.	9 13 10	2756	10 48 34	2694	12 25 22	2649	14 3 10	2621
	Aldebaran	E.	40 11 45	2183	38 22 52	2199	36 34 23	2216	34 46 20	2235
	Pollux	E.	84 7 34	2137	82 17 31	2148	80 27 45	2160	78 38 17	2172
10	Sun	W.	22 17 27	2604	23 56 16	2613	25 34 53	2624	27 13 15	2636
	Pollux	E.	69 35 52	2242	67 48 27	2258	66 1 25	2273	64 14 46	2289
	Regulus	E.	105 47 31	2250	104 0 18	2266	102 13 28	2281	100 27 0	2296
11	Sun	W.	35 20 37	2710	36 57 4	2727	38 33 8	2744	40 8 49	2763
	Pollux	E.	55 27 34	2375	53 43 23	2393	51 59 38	2411	50 16 19	2429
	Regulus	E.	91 40 35	2380	89 56 32	2398	88 12 54	2416	86 29 42	2433
12	Sun	W.	48 1 18	2854	49 34 36	2873	51 7 29	2893	52 39 57	2912
	Mars	W.	15 36 4	2761	17 11 23	2777	18 46 21	2793	20 20 58	2810
	Pollux	E.	41 46 20	2524	40 5 40	2543	38 25 27	2563	36 45 41	2583
	Regulus	E.	78 0 5	2525	76 19 27	2544	74 39 15	2562	72 59 28	2581
13	Sun	W.	60 16 19	3006	61 46 24	3024	63 16 7	3043	64 45 27	3060
	Mars	W.	28 8 23	2899	29 40 43	2916	31 12 41	2935	32 44 16	2951
	Aldebaran	W.	16 47 29	2896	18 19 53	2878	19 52 40	2867	21 25 41	2861
	Pollux	E.	28 33 34	2682	26 56 30	2702	25 19 53	2724	23 43 45	2747
	Regulus	E.	64 46 53	2672	63 9 36	2691	61 32 44	2709	59 56 16	2726
	Saturn	E.	77 28 7	2645	75 50 13	2663	74 12 43	2680	72 35 36	2698

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica W.	76° 9′ 15″	2492	77° 50′ 40″	2477	79° 32′ 25″	2464	81° 14′ 29″	2450
	Antares W.	30 18 18	2518	31 59 6	2500	33 40 19	2482	35 21 57	2466
	Venus E.	51 37 33	2882	50 4 51	2868	48 31 51	2855	46 58 34	2841
	Fomalhaut E.	55 24 37	2734	53 48 42	2732	52 12 45	2732	50 36 47	2738
	Sun E.	93 24 52	2806	91 50 35	2794	90 15 59	2779	88 41 3	2764
2	Spica W.	89 49 46	2380	91 33 49	2366	93 18 12	2353	95 2 54	2339
	Antares W.	43 55 55	2386	45 39 50	2370	47 24 8	2355	49 8 47	2340
	Venus E.	39 7 45	2775	37 32 45	2763	35 57 28	2750	34 21 55	2739
	Fomalhaut E.	42 38 2	2767	41 2 51	2784	39 28 2	2804	37 53 39	2828
	Sun E.	80 41 30	2689	79 4 36	2675	77 27 23	2660	75 49 49	2646
3	Spica W.	103 51 17	2274	105 37 55	2262	107 24 51	2249	109 12 5	2237
	Antares W.	57 57 22	2269	59 44 7	2256	61 31 11	2243	63 18 35	2229
	Venus E.	26 20 46	2696	24 44 1	2692	23 7 10	2690	21 30 17	2693
	Sun E.	67 37 7	2574	65 57 36	2561	64 17 47	2548	62 37 40	2536
4	Spica W.	118 12 33	2183	120 1 26	2173	121 50 34	2165	123 39 55	2156
	Antares W.	72 20 18	2169	74 9 32	2159	75 59 2	2148	77 48 48	2139
	Sun E.	54 12 41	2475	52 30 52	2463	50 48 47	2453	49 6 28	2444
5	Antares W.	87 1 9	2096	88 52 15	2088	90 43 32	2082	92 34 59	2077
	α Aquilæ W.	48 22 15	3797	49 38 33	3620	50 56 35	3549	52 16 13	3463
	Sun E.	40 31 44	2405	38 48 16	2396	37 4 39	2394	35 20 55	2390
6	Antares W.	101 54 7	2057	103 46 13	2055	105 38 22	2053	107 30 33	2053
	α Aquilæ W.	59 14 8	3167	60 40 57	3124	62 8 37	3086	63 37 4	3051
	Sun E.	26 41 26	2390	24 57 37	2394	23 13 54	2401	21 30 21	2410
9	Sun W.	15 41 36	2604	17 20 25	2596	18 59 26	2594	20 38 29	2598
	Aldebaran E.	32 58 44	2255	31 11 38	2277	29 25 4	2300	27 39 5	2325
	Pollux E.	76 49 7	2185	75 0 17	2199	73 11 48	2212	71 23 39	2227
10	Sun W.	28 51 21	2649	30 29 9	2663	32 6 39	2678	33 43 48	2693
	Pollux E.	62 28 30	2306	60 42 39	2322	58 57 12	2339	57 12 10	2357
	Regulus E.	98 40 55	2313	96 55 14	2328	95 9 56	2346	93 25 3	2363
11	Sun W.	41 44 6	2780	43 19 0	2798	44 53 30	2817	46 27 36	2836
	Pollux E.	48 33 26	2448	46 51 0	2467	45 9 0	2486	43 27 27	2504
	Regulus E.	84 46 55	2452	83 4 34	2470	81 22 38	2489	79 41 9	2507
12	Sun W.	54 12 1	2931	55 43 41	2950	57 14 57	2968	58 45 50	2987
	Mars W.	21 55 13	2828	23 29 5	2845	25 2 34	2863	26 35 40	2881
	Pollux E.	35 6 22	2602	33 27 30	2621	31 49 4	2641	30 11 5	2662
	Regulus E.	71 20 7	2599	69 41 11	2618	68 2 40	2636	66 24 34	2655
13	Sun W.	66 14 25	3078	67 43 1	3096	69 11 15	3114	70 39 8	3130
	Mars W.	34 15 30	2969	35 46 22	2986	37 16 52	3003	38 47 1	3019
	Aldebaran W.	22 58 50	2858	24 32 3	2859	26 5 15	2862	27 38 23	2866
	Pollux E.	22 8 7	2769	20 32 59	2793	18 58 22	2818	17 24 17	2843
	Regulus E.	58 20 11	2744	56 44 30	2761	55 9 11	2778	53 34 14	2795
	Saturn E.	70 58 53	2714	69 22 32	2731	67 46 33	2747	66 10 56	2764

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Sun	W.	72° 6′ 41″	3147	73° 33′ 54″	3164	75° 0′ 46″	3180	76° 27′ 19″	3196
	Aldebaran	W.	29 11 25	2873	30 44 18	2882	32 17 0	2891	33 49 31	2900
	Regulus	E.	51 59 40	2811	50 25 27	2828	48 51 36	2845	47 18 6	2861
	Saturn	E.	64 35 41	2780	63 0 47	2795	61 26 13	2811	59 51 59	2825
	Spica	E.	106 3 5	2811	104 28 51	2826	102 54 57	2841	101 21 22	2855
15	Sun	W.	83 35 32	3268	85 0 21	3282	86 24 53	3294	87 49 11	3307
	Aldebaran	W.	41 29 5	2948	43 0 23	2958	44 31 28	2968	46 2 21	2977
	Regulus	E.	39 35 41	2939	38 4 11	2953	36 32 59	2968	35 2 6	2983
	Saturn	E.	52 5 30	2895	50 33 5	2908	49 0 56	2920	47 29 3	2933
	Spica	E.	93 37 56	2923	92 6 6	2935	90 34 31	2946	89 3 11	2958
16	Sun	W.	94 47 14	3362	96 10 14	3372	97 33 3	3381	98 55 41	3390
	Aldebaran	W.	53 33 58	3021	55 3 45	3028	56 33 23	3035	58 2 52	3043
	Regulus	E.	27 32 24	3060	26 3 26	3077	24 34 48	3096	23 6 33	3114
	Saturn	E.	39 53 20	2988	38 22 52	2997	36 52 36	3008	35 22 33	3017
	Spica	E.	81 30 0	3010	80 0 0	3019	78 30 11	3027	77 0 32	3036
17	Sun	W.	105 46 36	3425	107 8 24	3431	108 30 6	3436	109 51 42	3441
	Aldebaran	W.	65 28 16	3072	66 57 0	3076	68 25 39	3080	69 54 13	3084
	Pollux	W.	21 17 7	3087	22 45 32	3089	24 13 55	3090	25 42 17	3091
	Spica	E.	69 34 41	3071	68 5 56	3076	66 37 17	3082	65 8 45	3086
	Antares	E.	115 28 0	3062	113 59 4	3067	112 30 14	3071	111 1 29	3074
18	Sun	W.	116 38 33	3456	117 59 46	3459	119 20 56	3460	120 42 5	3462
	Aldebaran	W.	77 16 0	3097	78 44 13	3099	80 12 24	3100	81 40 34	3101
	Pollux	W.	33 3 53	3094	34 32 10	3095	36 0 26	3095	37 28 42	3094
	Spica	E.	57 47 23	3105	56 19 19	3108	54 51 19	3110	53 23 21	3112
	Antares	E.	103 38 45	3088	102 10 21	3090	100 41 59	3091	99 13 38	3091
19	Sun	W.	127 27 41	3459	128 48 51	3458	130 10 2	3456	131 31 15	3454
	Aldebaran	W.	89 1 21	3098	90 29 33	3096	91 57 47	3095	93 26 3	3092
	Pollux	W.	44 50 17	3088	46 18 41	3086	47 47 8	3084	49 15 37	3081
	Spica	E.	46 4 4	3119	44 36 17	3119	43 8 30	3119	41 40 44	3120
	Antares	E.	91 51 58	3090	90 23 36	3067	88 55 11	3086	87 26 44	3083
20	Aldebaran	W.	100 48 12	3077	102 16 50	3073	103 45 32	3069	105 14 20	3065
	Pollux	W.	56 39 2	3063	58 7 57	3059	59 36 57	3054	61 6 3	3048
	Regulus	W.	20 49 42	3163	22 16 35	3147	23 43 48	3132	25 11 19	3118
	Spica	E.	34 22 4	3124	32 54 23	3125	31 26 44	3127	29 59 7	3129
	Antares	E.	80 3 41	3068	78 34 52	3064	77 5 58	3059	75 36 58	3055
21	Pollux	W.	68 33 12	3020	70 3 0	3014	71 32 55	3008	73 2 58	3001
	Regulus	W.	32 32 41	3062	34 1 37	3052	35 30 45	3043	37 0 5	3033
	Saturn	W.	20 2 34	3049	21 31 46	3037	23 1 13	3026	24 30 54	3015
	Antares	E.	68 10 30	3029	66 40 53	3022	65 11 8	3016	63 41 15	3010
22	Pollux	W.	80 35 25	2965	82 6 22	2958	83 37 28	2949	85 8 45	2942
	Regulus	W.	44 29 36	2988	46 0 4	2978	47 30 44	2969	49 1 35	2961
	Saturn	W.	32 2 26	2968	33 33 19	2958	35 4 24	2950	36 35 40	2940
	Antares	E.	56 9 54	2977	54 39 13	2970	53 8 23	2963	51 37 24	2956
	α Aquilæ	E.	103 6 11	3793	101 51 2	3777	100 35 36	3761	99 19 53	3746

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Sun	W.	77° 53′ 33″	3211	79° 19′ 29″	3226	80° 45′ 7″	3241	82° 10′ 28″	3256
	Aldebaran	W.	35 21 50	2909	36 53 57	2919	38 25 52	2929	39 57 35	2939
	Regulus	E.	45 44 57	2876	44 12 8	2893	42 39 40	2908	41 7 31	2923
	Saturn	E.	58 18 4	2840	56 44 28	2855	55 11 11	2869	53 38 12	2882
	Spica	E.	99 48 5	2869	98 15 7	2883	96 42 26	2897	95 10 3	2909
15	Sun	W.	89 13 14	3319	90 37 3	3331	92 0 39	3341	93 24 3	3352
	Aldebaran	W.	47 33 3	2986	49 3 33	2995	50 33 52	3004	52 4 0	3012
	Regulus	E.	33 31 32	2998	32 1 17	3013	30 31 20	3028	29 1 42	3044
	Saturn	E.	45 57 26	2944	44 26 3	2956	42 54 55	2967	41 24 1	2977
	Spica	E.	87 32 6	2969	86 1 15	2980	84 30 37	2990	83 0 12	3001
16	Sun	W.	100 18 9	3398	101 40 28	3406	103 2 38	3412	104 24 41	3419
	Aldebaran	W.	59 32 12	3049	61 1 24	3055	62 30 29	3061	63 59 26	3067
	Regulus	E.	21 38 41	3137	20 11 16	3162	18 44 21	3190	17 18 0	3225
	Saturn	E.	33 52 41	3026	32 23 0	3034	30 53 30	3043	29 24 11	3052
	Spica	E.	75 31 4	3043	74 1 45	3051	72 32 35	3058	71 3 34	3065
17	Sun	W.	111 13 12	3445	112 34 38	3448	113 56 0	3451	115 17 19	3455
	Aldebaran	W.	71 22 42	3087	72 51 7	3091	74 19 28	3094	75 47 45	3096
	Pollux	W.	27 10 38	3091	28 38 58	3092	30 7 17	3093	31 35 35	3093
	Spica	E.	63 40 18	3091	62 11 57	3095	60 43 41	3099	59 15 30	3102
	Antares	E.	109 32 48	3076	108 4 12	3080	106 35 40	3084	105 7 11	3087
18	Sun	W.	122 3 12	3462	123 24 19	3462	124 45 26	3462	126 6 33	3461
	Aldebaran	W.	83 8 43	3101	84 36 52	3101	86 5 1	3100	87 33 11	3100
	Pollux	W.	38 56 59	3094	40 25 16	3092	41 53 35	3091	43 21 55	3090
	Spica	E.	51 55 26	3114	50 27 33	3115	48 59 42	3116	47 31 52	3118
	Antares	E.	97 45 18	3091	96 16 58	3092	94 48 39	3091	93 20 19	3091
19	Sun	W.	132 52 30	3452	134 13 48	3448	135 35 10	3446	136 56 35	3443
	Aldebaran	W.	94 54 22	3090	96 22 44	3087	97 51 9	3084	99 19 38	3080
	Pollux	W.	50 44 10	3078	52 12 46	3074	53 41 27	3071	55 10 12	3067
	Spica	E.	40 12 59	3120	38 45 14	3121	37 17 30	3121	35 49 46	3123
	Antares	E.	85 58 14	3081	84 29 41	3078	83 1 5	3075	81 32 25	3072
20	Aldebaran	W.	106 43 13	3060	108 12 11	3055	109 41 16	3050	111 10 27	3044
	Pollux	W.	62 35 16	3043	64 4 35	3039	65 34 0	3033	67 3 32	3028
	Regulus	W.	26 39 7	3105	28 7 10	3094	29 35 27	3083	31 3 57	3072
	Spica	E.	28 31 33	3133	27 4 4	3138	25 36 41	3146	24 9 27	3156
	Antares	E.	74 7 53	3050	72 38 42	3044	71 9 24	3039	69 40 0	3034
21	Pollux	W.	74 33 10	2994	76 3 30	2987	77 33 59	2980	79 4 37	2972
	Regulus	W.	38 29 37	3024	39 59 20	3015	41 29 14	3006	42 59 19	2997
	Saturn	W.	26 0 48	3005	27 30 54	2995	29 1 13	2985	30 31 44	2977
	Antares	E.	62 11 15	3004	60 41 7	2997	59 10 51	2991	57 40 27	2984
22	Pollux	W.	86 40 11	2934	88 11 47	2925	89 43 34	2917	91 15 31	2909
	Regulus	W.	50 32 37	2952	52 3 50	2943	53 35 15	2934	55 6 51	2924
	Saturn	W.	38 7 8	2931	39 38 47	2923	41 10 37	2913	42 42 39	2905
	Antares	E.	50 6 16	2960	48 35 0	2949	47 3 35	2938	45 32 1	2928
	α Aquilæ	E.	98 3 55	3732	96 47 42	3719	95 31 15	3707	94 14 35	3695

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	Pollux	W.	92° 47′ 38″	2901	94° 19′ 56″	2892	95° 52′ 25″	2884	97° 25′ 4″	2876
	Regulus	W.	56 38 39	2916	58 10 38	2906	59 42 49	2898	61 15 11	2889
	SATURN	W.	44 14 52	2896	45 47 16	2887	47 19 52	2878	48 52 39	2869
	Antares	E.	44 0 18	2921	42 28 26	2915	40 56 26	2908	39 24 17	2901
	α Aquilæ	E.	92 57 43	3685	91 40 40	3675	90 23 26	3667	89 6 4	3659
24	Pollux	W.	105 11 4	2833	106 44 49	2824	108 18 46	2815	109 52 54	2807
	Regulus	W.	68 59 54	2843	70 33 26	2835	72 7 9	2825	73 41 4	2816
	SATURN	W.	56 39 26	2825	58 13 22	2815	59 47 30	2807	61 21 49	2798
	Antares	E.	31 41 35	2873	30 8 42	2869	28 35 44	2866	27 2 41	2863
	α Aquilæ	E.	82 37 27	3635	81 19 30	3633	80 1 31	3632	78 43 31	3632
	Fomalhaut	E.	114 10 18	3030	112 40 43	3017	111 10 51	3004	109 40 43	2991
25	Regulus	W.	81 33 36	2771	83 8 42	2763	84 43 59	2753	86 19 28	2744
	SATURN	W.	69 16 21	2753	70 51 50	2744	72 27 31	2735	74 3 24	2727
	Spica	W.	27 46 13	2848	29 19 38	2831	30 53 25	2815	32 27 33	2801
	α Aquilæ	E.	72 14 4	3654	70 56 28	3663	69 39 1	3673	68 21 45	3686
	Fomalhaut	E.	102 6 15	2933	100 34 38	2923	99 2 48	2912	97 30 45	2902
26	Regulus	W.	94 19 49	2701	95 56 27	2692	97 33 17	2684	99 10 19	2675
	SATURN	W.	82 5 42	2683	83 42 45	2675	85 19 59	2666	86 57 25	2657
	Spica	W.	40 22 51	2736	41 58 45	2722	43 34 55	2711	45 11 20	2701
	α Aquilæ	E.	61 59 27	3780	60 44 4	3807	59 29 9	3837	58 14 45	3871
	Fomalhaut	E.	89 47 22	2855	88 14 6	2848	86 40 40	2839	85 7 3	2831
	α Pegasi	E.	108 5 8	3137	106 37 43	3120	105 9 58	3105	103 41 55	3090
27	SATURN	W.	95 7 29	2614	96 46 5	2606	98 24 52	2597	100 3 51	2588
	Spica	W.	53 16 59	2649	54 54 48	2638	56 32 51	2629	58 11 7	2618
	α Aquilæ	E.	52 12 39	4106	51 2 43	4168	49 53 47	4239	48 45 58	4318
	Fomalhaut	E.	77 16 32	2796	75 41 59	2790	74 7 18	2785	72 32 30	2779
	α Pegasi	E.	96 17 24	3027	94 47 45	3017	93 17 53	3006	91 47 48	2997
	SUN	E.	141 17 54	2961	139 46 52	2950	138 15 37	2941	136 44 10	2931
28	Spica	W.	66 25 45	2572	68 5 19	2562	69 45 6	2553	71 25 6	2543
	Antares	W.	20 40 18	2640	22 18 19	2618	23 56 49	2599	25 35 45	2583
	Fomalhaut	E.	64 36 55	2760	63 1 34	2756	61 26 9	2755	59 50 42	2754
	α Pegasi	E.	84 14 44	2960	82 43 41	2954	81 12 30	2949	79 41 13	2945
	VENUS	E.	92 22 39	2957	90 51 32	2947	89 20 13	2937	87 48 41	2927
	SUN	E.	129 3 43	2881	127 31 0	2871	125 58 4	2862	124 24 56	2852
29	Spica	W.	79 48 17	2498	81 29 33	2489	83 11 1	2480	84 52 42	2471
	Antares	W.	33 55 38	2515	35 36 31	2503	37 17 40	2491	38 59 6	2480
	Fomalhaut	E.	51 53 33	2764	50 18 18	2769	48 43 10	2777	47 8 12	2786
	α Pegasi	E.	72 3 49	2935	70 32 15	2937	69 0 43	2939	67 29 13	2942
	VENUS	E.	80 8 0	2880	78 35 15	2869	77 2 17	2860	75 29 7	2851
	SUN	E.	116 36 6	2803	115 1 42	2794	113 27 6	2784	111 52 17	2774
30	Spica	W.	93 24 15	2427	95 7 11	2419	96 50 19	2410	98 33 40	2401
	Antares	W.	47 30 2	2428	49 12 57	2418	50 56 6	2408	52 39 29	2399
	α Pegasi	E.	59 53 18	2979	58 22 39	2993	56 52 17	3008	55 22 14	3025
	VENUS	E.	67 40 12	2803	66 5 48	2794	64 31 12	2784	62 56 23	2774
	SUN	E.	103 55 0	2725	102 18 54	2716	100 42 36	2707	99 6 5	2697

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	Pollux	W.	98° 57′ 54″	2867	100° 30′ 55″	2859	102° 4′ 7″	2850	103° 37′ 30″	2842
	Regulus	W.	62 47 44	2880	64 20 29	2870	65 53 26	2862	67 26 34	2853
	SATURN	W.	50 25 37	2860	51 58 47	2852	53 32 8	2843	55 5 41	2833
	Antares	E.	37 52 0	2695	36 19 35	2689	34 47 2	2683	33 14 22	2678
	α Aquilæ	E.	87 48 33	3652	86 30 55	3647	85 13 11	3641	83 55 21	3637
24	Pollux	W.	111 27 13	2798	113 1 43	2789	114 36 25	2781	116 11 18	2772
	Regulus	W.	75 15 11	2807	76 49 30	2798	78 24 0	2789	79 58 42	2780
	SATURN	W.	62 56 20	2788	64 31 3	2780	66 5 57	2771	67 41 3	2762
	Antares	E.	25 29 35	2662	23 56 28	2662	22 23 21	2666	20 50 18	2671
	α Aquilæ	E.	77 25 31	3634	76 7 33	3636	74 49 38	3641	73 31 48	3647
	Fomalhaut	E.	108 10 19	2979	106 39 40	2967	105 8 46	2956	103 37 38	2944
25	Regulus	W.	87 55 9	2735	89 31 2	2727	91 7 6	2718	92 43 22	2710
	SATURN	W.	75 39 28	2718	77 15 44	2709	78 52 12	2701	80 28 51	2692
	Spica	W.	34 2 0	2786	35 36 46	2773	37 11 51	2759	38 47 13	2747
	α Aquilæ	E.	67 4 42	3700	65 47 55	3716	64 31 25	3735	63 15 15	3756
	Fomalhaut	E.	95 58 29	2692	94 26 0	2683	92 53 19	2673	91 20 26	2665
26	Regulus	W.	100 47 33	2666	102 24 58	2658	104 2 34	2649	105 40 22	2641
	SATURN	W.	88 35 2	2649	90 12 51	2640	91 50 52	2631	93 29 5	2623
	Spica	W.	46 47 59	2689	48 24 53	2679	50 2 1	2669	51 39 23	2658
	α Aquilæ	E.	57 0 56	3909	55 47 45	3949	54 35 15	3996	53 23 31	4048
	Fomalhaut	E.	83 33 16	2824	81 59 19	2816	80 25 12	2809	78 50 56	2803
	α Pegasi	E.	102 13 33	3076	100 44 54	3063	99 15 59	3051	97 46 49	3039
27	SATURN	W.	101 43 2	2580	103 22 25	2572	105 1 59	2563	106 41 45	2554
	Spica	W.	59 49 37	2610	61 28 19	2599	63 7 15	2590	64 46 24	2581
	α Aquilæ	E.	47 39 22	4405	46 34 5	4502	45 30 15	4611	44 28 0	4733
	Fomalhaut	E.	70 57 35	2775	69 22 34	2769	67 47 26	2766	66 12 13	2762
	α Pegasi	E.	90 17 32	2989	88 47 5	2980	87 16 27	2973	85 45 40	2965
	SUN	E.	135 12 30	2920	133 40 37	2911	132 8 32	2901	130 36 14	2891
28	Spica	W.	73 5 19	2534	74 45 45	2525	76 26 23	2516	78 7 14	2507
	Antares	W.	27 15 4	2567	28 54 44	2553	30 34 44	2540	32 15 2	2527
	Fomalhaut	E.	58 15 14	2754	56 39 46	2755	55 4 19	2756	53 28 54	2760
	α Pegasi	E.	78 9 51	2942	76 38 25	2939	75 6 55	2937	73 35 23	2935
	VENUS	E.	86 16 57	2918	84 45 1	2909	83 12 53	2899	81 40 33	2889
	SUN	E.	122 51 35	2842	121 18 2	2832	119 44 16	2822	118 10 17	2813
29	Spica	W.	86 34 36	2462	88 16 42	2453	89 59 1	2445	91 41 32	2436
	Antares	W.	40 40 47	2470	42 22 43	2458	44 4 55	2448	45 47 21	2438
	Fomalhaut	E.	45 33 26	2798	43 58 55	2811	42 24 41	2828	40 50 50	2849
	α Pegasi	E.	65 57 47	2946	64 26 27	2952	62 55 14	2959	61 24 10	2969
	VENUS	E.	73 55 45	2841	72 22 10	2831	70 48 23	2822	69 14 24	2812
	SUN	E.	110 17 15	2764	108 42 0	2755	107 6 33	2745	105 30 53	2735
30	Spica	W.	100 17 13	2393	102 0 58	2384	103 44 55	2376	105 29 4	2368
	Antares	W.	54 23 5	2389	56 6 55	2380	57 50 59	2371	59 35 16	2361
	α Pegasi	E.	53 52 32	3046	52 23 16	3070	50 54 30	3097	49 26 17	3129
	VENUS	E.	61 21 21	2765	59 46 7	2756	58 10 41	2747	56 35 3	2737
	SUN	E.	97 29 21	2687	95 52 24	2678	94 15 15	2669	92 37 54	2660

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	2 33 31.03	9.541	N.15 4 33.4	+45.38	15 54.28	66.06	2 58.98	0.315
Sat.	2	2 37 20 31	9.565	15 22 35.1	44.76	15 54.04	66.14	3 6.24	0.291
SUN.	3	2 41 10.14	9.588	15 40 21.7	44.12	15 53.80	66.22	3 12.95	0.268
Mon.	4	2 45 0.54	9.612	15 57 52.9	+43.47	15 53.56	66.30	3 19.09	0.244
Tues.	5	2 48 51.51	9.635	16 15 8.3	42.81	15 53.33	66.38	3 24.66	0.221
Wed.	6	2 52 43.06	9.659	16 32 7.6	42.13	15 53.10	66.46	3 29.65	0.197
Thur.	7	2 56 35.18	9.684	16 48 50.5	+41.44	15 52.88	66.54	3 34.07	0.173
Frid.	8	3 0 27.88	9.708	17 5 16.7	40.74	15 52.66	66.62	3 37.92	0.149
Sat.	9	3 4 21.15	9.732	17 21 25.9	40.02	15 52.44	66.70	3 41.20	0.125
SUN.	10	3 8 14.99	9.756	17 37 17.6	+39.29	15 52.23	66.78	3 43.90	0.101
Mon.	11	3 12 9.40	9.780	17 52 51.6	38.55	15 52.02	66.86	3 46.04	0.077
Tues.	12	3 16 4.38	9.803	18 8 7.6	37.79	15 51.81	66.95	3 47.62	0.054
Wed.	13	3 19 59 93	9.826	18 23 5.4	+37.02	15 51.61	67.03	3 48.63	0.031
Thur.	14	3 23 56.03	9.849	18 37 44.6	36.24	15 51.41	67.11	3 49.08	0.008
Frid.	15	3 27 52.68	9.872	18 52 4.8	35.44	15 51.22	67.19	3 48.99	0.015
Sat.	16	3 31 49.88	9.895	19 6 5.8	+34.64	15 51.03	67.28	3 48.35	0.038
SUN.	17	3 35 47.63	9.918	19 19 47.3	33.83	15 50.84	67.36	3 47.16	0.061
Mon.	18	3 39 45 93	9.940	19 33 9.1	33.00	15 50.66	67.44	3 45.42	0.083
Tues.	19	3 43 44.77	9.963	19 46 10.9	+32.16	15 50.48	67.52	3 43.14	0.106
Wed.	20	3 47 44.15	9.985	19 58 52.6	31.31	15 50.30	67.60	3 40.32	0.128
Thur.	21	3 51 44.06	10.007	20 11 13.8	30.45	15 50.12	67.68	3 36.98	0.150
Frid.	22	3 55 41.50	10.030	20 23 14.3	+29.58	15 49.95	67.75	3 33.11	0.172
Sat.	23	3 59 45.47	10.052	20 34 53.9	28.70	15 49.77	67.83	3 28.71	0.194
SUN.	24	4 3 46 96	10.073	20 46 12.4	27.82	15 49.60	67.90	3 23.79	0.216
Mon.	25	4 7 48.97	10.095	20 57 9.5	+26.92	15 49.43	67.97	3 18.35	0.237
Tues.	26	4 11 51.48	10.116	21 7 45.1	26.02	15 49.27	68.04	3 12.41	0.258
Wed.	27	4 15 54.49	10.136	21 17 58.9	25.11	15 49.11	68.11	3 5.97	0.278
Thur.	28	4 19 58.00	10.156	21 27 50.7	+24.19	15 48.95	68.17	2 59.04	0.298
Frid.	29	4 24 1.98	10.176	21 37 20.3	23.26	15 48.79	68.23	2 51.63	0.318
Sat.	30	4 28 6.43	10.195	21 46 27.6	22.33	15 48.64	68.29	2 43.76	0.337
SUN.	31	4 32 11.33	10.213	21 55 12.3	21.38	15 48.49	68.35	2 35.44	0.355
Mon.	32	4 36 16.68	10.231	N.22 3 34.2	+20.43	15 48.35	68.41	2 26.67	0.373

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	2 33 31.50	9.542	N. 15 4 35.6	+45.38	2 59.00	0.315	2 36 30.51
Sat.	2	2 37 20 80	9.566	15 22 37.4	44.76	3 6.26	0.291	2 40 27.06
SUN.	3	2 41 10.65	9.589	15 40 24.0	44.12	3 12.96	0.268	2 44 23.61
Mon.	4	2 45 1.07	9.613	15 57 55.2	+43.47	3 19.10	0.244	2 48 20.17
Tues.	5	2 48 52.06	9.636	16 15 10.7	42.81	3 24.67	0.221	2 52 16.73
Wed.	6	2 52 43.62	9.660	16 32 10.1	42.13	3 29.66	0.197	2 56 13.28
Thur.	7	2 56 35.76	9.684	16 48 53.0	+41.44	3 34.08	0.173	3 0 9.84
Frid.	8	3 0 28.47	9.708	17 5 19.2	40.74	3 37.93	0.149	3 4 6.40
Sat.	9	3 4 21.75	9.732	17 21 28.4	40.02	3 41.21	0.125	3 8 2.96
SUN.	10	3 8 15.60	9.756	17 37 20.1	+39.29	3 43.91	0.101	3 11 59.51
Mon.	11	3 12 10.02	9.780	17 52 54.1	38.55	3 46.05	0.077	3 15 56.07
Tues.	12	3 16 5.00	9.803	18 8 10.1	37.79	3 47.62	0.054	3 19 52.62
Wed.	13	3 20 0.55	9.826	18 23 7.8	+37.02	3 48.63	0.031	3 23 49.18
Thur.	14	3 23 56.65	9.849	18 37 46.9	36.24	3 49.08	0.008	3 27 45.73
Frid.	15	3 27 53.30	9.872	18 52 7.0	35.44	3 48.99	0.015	3 31 42.29
Sat.	16	3 31 50.50	9.895	19 6 8.0	+34.64	3 48.35	0.038	3 35 38.85
SUN.	17	3 35 48.25	9.918	19 19 49.5	33.83	3 47.16	0.061	3 39 35.41
Mon.	18	3 39 46.55	9.940	19 33 11.2	33.00	3 45.42	0.083	3 43 31.97
Tues.	19	3 43 45 39	9.963	19 46 13.0	+32.16	3 43.13	0.106	3 47 28.52
Wed.	20	3 47 44.76	9.985	19 58 54.6	31.31	3 40.31	0.128	3 51 25.07
Thur.	21	3 51 44.66	10.007	20 11 15.7	30.45	3 36.97	0.150	3 55 21.63
Frid.	22	3 55 45.09	10.029	20 23 16.1	+29.58	3 33.10	0.172	3 59 18.19
Sat.	23	3 59 46.05	10.051	20 34 55.6	28.70	3 28.70	0.194	4 3 14.75
SUN.	24	4 3 47.53	10.072	20 46 14.0	27.82	3 23.78	0.216	4 7 11.31
Mon.	25	4 7 49.52	10.094	20 57 11.0	+26.92	3 18.34	0.237	4 11 7.86
Tues.	26	4 11 52.02	10.115	21 7 46.5	26.02	3 12.40	0.258	4 15 4.42
Wed.	27	4 15 55.02	10.135	21 18 0.2	25.11	3 5.96	0.278	4 19 0.98
Thur.	28	4 19 58.51	10.155	21 27 51.9	+24.19	2 59.02	0.298	4 22 57.53
Frid.	29	4 24 2.47	10.175	21 37 21.4	23.26	2 51.62	0.318	4 26 54.09
Sat.	30	4 28 6 90	10.194	21 46 28.6	22.33	2 43.75	0.337	4 30 50.65
SUN.	31	4 32 11.78	10.212	21 55 13.2	21.38	2 35.43	0.355	4 34 47.21
Mon.	32	4 36 17.10	10.230	N. 22 3 35.0	+20.43	2 26.66	0.373	4 38 43.76

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ'	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon. h m s
1	121	40° 48′ 45″.8	48′ 46″.2	145″.47	− 0″.39	0.0034983	+46.2	21 19 59.23
2	122	41 46 56.3	46 56.6	145.41	0.43	0.0036088	45.8	21 16 3.32
3	123	42 45 5.4	45 5.6	145.34	0.44	0.0037179	45.2	21 12 7.40
4	124	43 43 13.0	43 13.0	145.28	− 0.42	0.0038256	+44.6	21 8 11.49
5	125	44 41 19.1	41 18.9	145.22	0.37	0.0039318	43.9	21 4 15.58
6	126	45 39 23.7	39 23.4	145.16	0.29	0.0040363	43.2	21 0 19.67
7	127	46 37 26.8	37 26.4	145.10	− 0.19	0.0041391	+42.5	20 56 23.76
8	128	47 35 28.4	35 27.8	145.03	− 0.07	0.0042401	41.7	20 52 27.85
9	129	48 33 28.4	33 27.6	144.97	+ 0.06	0.0043391	40.9	20 48 31.94
10	130	49 31 26.7	31 25.7	144.90	+ 0.20	0.0044362	+40.1	20 44 36.03
11	131	50 29 23.3	29 22.2	144.83	0.33	0.0045315	39.3	20 40 40.12
12	132	51 27 18.3	27 17.1	144.76	0.46	0.0046251	38.6	20 36 44.21
13	133	52 25 11.6	25 10.3	144.69	+ 0.56	0.0047169	+37.9	20 32 48.30
14	134	53 23 3.1	23 1.6	144.61	0.64	0.0048068	37.2	20 28 52.39
15	135	54 20 52.8	20 51.1	144.54	0.69	0.0048950	36.5	20 24 56.48
16	136	55 18 40.8	18 39.0	144.46	+ 0.71	0.0049817	+35.9	20 21 0.57
17	137	56 16 27.1	16 25.2	144.39	0.71	0.0050671	35.4	20 17 4.66
18	138	57 14 11.8	14 9.7	144.33	0.68	0.0051513	34.9	20 13 8.75
19	139	58 11 54.8	11 52.5	144.26	+ 0.62	0.0052344	+34.4	20 9 12.84
20	140	59 9 36.3	9 33.8	144.20	0.53	0.0053163	33.9	20 5 16.93
21	141	60 7 16.3	7 13.7	144.14	0.42	0.0053971	33.4	20 1 21.02
22	142	61 4 54.9	4 52.2	144.08	+ 0.29	0.0054768	+33.0	19 57 25.11
23	143	62 2 32.2	2 29.3	144.03	0.16	0.0055555	32.6	19 53 29.19
24	144	63 0 8.3	0 5.2	143.98	+ 0.03	0.0056332	32.2	19 49 33.28
25	145	63 57 43.2	57 40.0	143.94	− 0.10	0.0057099	+31.7	19 45 37.37
26	146	64 55 17.1	55 13.7	143.90	0.21	0.0057854	31.2	19 41 41.46
27	147	65 52 50.0	52 46.4	143.86	0.30	0.0058598	30.7	19 37 45.55
28	148	66 50 21.9	50 18.1	143.82	− 0.37	0.0059329	+30.2	19 33 49.64
29	149	67 47 53.0	47 49.0	143.78	0.41	0.0060045	29.5	19 29 53.73
30	150	68 45 23.3	45 19.1	143.75	0.42	0.0060744	28.8	19 25 57.82
31	151	69 42 52.9	42 48.5	143.71	0.40	0.0061427	28.0	19 22 1.91
32	152	70 40 21.7	40 17.2	143.68	− 0.35	0.0062091	+27.2	19 18 6.01

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ', to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 5.3	16 9.0	58 56.1	+1.17	59 9.6	+1.10	19 0.8	2.30	22.6
2	16 12.4	16 15.5	59 22.2	1.01	59 33.7	0.89	19 54.8	2.21	23.6
3	16 18.2	16 20.3	59 43.5	0.74	59 51.4	0.58	20 46.7	2.14	24.6
4	16 21.9	16 22.8	59 57.2	+0.39	60 0.5	+0.17	21 37.3	2.10	25.6
5	16 23.0	16 22.3	60 1.1	−0.08	59 58.7	−0.34	22 27.5	2.11	26.6
6	16 20.8	16 18.5	59 53.2	0.59	59 44.6	0.84	23 18.5	2.15	27.6
7	16 15.3	16 11.4	59 33.0	−1.09	59 18.6	−1.32	☌		28.6
8	16 6.8	16 1.5	59 1.5	1.52	58 42.2	1.69	0 10.9	2.22	0.2
9	15 55.8	15 49.6	58 21.1	1.82	57 58.6	1.91	1 5.2	2.29	1.2
10	15 43.3	15 36.8	57 35.2	−1.97	57 11.4	−1.98	2 1.0	2.33	2.2
11	15 30.4	15 24.1	56 47.8	1.94	56 24.7	1.89	2 57.1	2.32	3.2
12	15 18.0	15 12.4	56 2.5	1.80	55 41.7	1.67	3 52.1	2.24	4.2
13	15 7.2	15 2.5	55 22.6	−1.51	55 5.5	−1.34	4 44.8	2.13	5.2
14	14 58.4	14 55.0	54 50.5	1.16	54 37.9	0.96	5 34.4	2.00	6.2
15	14 52.2	14 50.1	54 27.7	0.75	54 20.1	0.53	6 20.8	1.87	7.2
16	14 48.8	14 48.1	54 15.1	−0.32	54 12.6	−0.11	7 4.3	1.77	8.2
17	14 48.2	14 48.9	54 12.8	+0.11	54 15.4	+0.32	7 45.9	1.71	9.2
18	14 50.2	14 52.2	54 20.3	0.51	54 27.5	0.69	8 26.5	1.69	10.2
19	14 54.7	14 57.7	54 36.8	+0.86	54 47.9	+1.00	9 6.9	1.71	11.2
20	15 1.2	15 5.1	55 0.7	1.13	55 14.9	1.24	9 48.4	1.77	12.2
21	15 9.3	15 13.7	55 30.3	1.33	55 46.6	1.39	10 31.9	1.87	13.2
22	15 18.3	15 23.0	56 3.5	+1.42	56 20.8	+1.45	11 18.4	2.02	14.2
23	15 27.7	15 32.4	56 38.1	1.45	56 55.2	1.42	12 8.7	2.18	15.2
24	15 36.9	15 41.3	57 11.9	1.37	57 28.0	1.31	13 3.0	2.33	16.2
25	15 45.5	15 49.4	57 43.3	+1.24	57 57.6	+1.15	14 0.7	2.44	17.2
26	15 53.0	15 56.3	58 10.9	1.07	58 23.1	0.97	15 0.3	2.48	18.2
27	15 59.3	16 2.0	58 34.1	0.87	58 44.0	0.78	15 59.6	2.43	19.2
28	16 4.4	16 6.4	58 52.7	+0.68	59 0.2	+0.58	16 56.8	2.32	20.2
29	16 8.1	16 9.6	59 6.6	0.49	59 11.8	0.39	17 51.2	2.21	21.2
30	16 10.7	16 11.4	59 15.8	0.29	59 18.7	+0.19	18 42.9	2.11	22.2
31	16 11.9	16 12.0	59 20.3	+0.08	59 20.6	−0.04	19 32.5	2.05	23.2
32	16 11.7	16 11.0	59 19.5	−0.16	59 16.9	−0.29	20 21.2	2.04	24.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 54 25.72	2.4510	S. 22 20 45.1	8.297
1	20 56 52.68	2.4477	22 12 23.0	8.440
2	20 59 19.44	2.4443	22 3 52.3	8.582
3	21 1 45.99	2.4408	21 55 13.1	8.723
4	21 4 12.34	2.4374	21 46 25.5	8.863
5	21 6 38.48	2.4340	21 37 29.5	9.003
6	21 9 4.42	2.4306	21 28 25.1	9.142
7	21 11 30.15	2.4270	21 19 12.5	9.278
8	21 13 55.66	2.4234	21 9 51.7	9.414
9	21 16 20.95	2.4198	21 0 22.8	9.548
10	21 18 46.03	2.4162	20 50 45.9	9.682
11	21 21 10.89	2.4125	20 41 0.9	9.816
12	21 23 35.53	2.4088	20 31 8.0	9.947
13	21 25 59.95	2.4051	20 21 7.3	10.077
14	21 28 24.14	2.4013	20 10 58.8	10.207
15	21 30 48.11	2.3976	20 0 42.5	10.335
16	21 33 11.86	2.3939	19 50 18.6	10.462
17	21 35 35.38	2.3901	19 39 47.1	10.587
18	21 37 58.67	2.3862	19 29 8.1	10.712
19	21 40 21.73	2.3824	19 18 21.7	10.835
20	21 42 44.56	2.3787	19 7 27.9	10.957
21	21 45 7.17	2.3749	18 56 26.9	11.077
22	21 47 29.55	2.3711	18 45 18.7	11.197
23	21 49 51.70	2.3672	S. 18 34 3.3	11.315

SATURDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 52 13.62	2.3634	S. 18 22 40.9	11.432
1	21 54 35.31	2.3596	18 11 11.5	11.547
2	21 56 56.78	2.3558	17 59 35.2	11.662
3	21 59 18.01	2.3519	17 47 52.1	11.775
4	22 1 39.01	2.3482	17 36 2.2	11.887
5	22 3 59.79	2.3444	17 24 5.7	11.996
6	22 6 20.34	2.3406	17 12 2.7	12.104
7	22 8 40.66	2.3368	16 59 53.2	12.212
8	22 11 0.76	2.3331	16 47 37.2	12.319
9	22 13 20.63	2.3294	16 35 14.9	12.424
10	22 15 40.28	2.3257	16 22 46.3	12.527
11	22 17 59.71	2.3220	16 10 11.6	12.629
12	22 20 18.92	2.3183	15 57 30.8	12.730
13	22 22 37.91	2.3147	15 44 44.0	12.829
14	22 24 56.68	2.3110	15 31 51.3	12.928
15	22 27 15.23	2.3074	15 18 52.7	13.025
16	22 29 33.57	2.3039	15 5 48.3	13.119
17	22 31 51.70	2.3004	14 52 38.4	13.211
18	22 34 9.62	2.2969	14 39 23.0	13.303
19	22 36 27.33	2.2934	14 26 2.1	13.394
20	22 38 44.83	2.2900	14 12 35.7	13.484
21	22 41 2.13	2.2866	13 59 4.0	13.572
22	22 43 19.22	2.2832	13 45 27.1	13.658
23	22 45 36.11	2.2799	13 31 45.1	13.743
24	22 47 52.81	2.2767	S. 13 17 58.0	13.826

SUNDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 47 52.81	2.2767	S. 13 17 58.0	13.826
1	22 50 9.31	2.2734	13 4 6.0	13.907
2	22 52 25.62	2.2702	12 50 9.1	13.987
3	22 54 41.74	2.2671	12 36 7.5	14.066
4	22 56 57.67	2.2640	12 22 1.2	14.144
5	22 59 13.42	2.2609	12 7 50.2	14.220
6	23 1 28.98	2.2578	11 53 34.8	14.294
7	23 3 44.36	2.2549	11 39 15.0	14.367
8	23 5 59.57	2.2521	11 24 50.8	14.438
9	23 8 14.61	2.2492	11 10 22.4	14.508
10	23 10 29.48	2.2464	10 55 49.8	14.577
11	23 12 44.18	2.2436	10 41 13.2	14.643
12	23 14 58.71	2.2408	10 26 32.7	14.708
13	23 17 13.08	2.2382	10 11 48.3	14.772
14	23 19 27.30	2.2357	9 57 0.1	14.833
15	23 21 41.37	2.2332	9 42 8.3	14.893
16	23 23 55.29	2.2307	9 27 12.9	14.952
17	23 26 9.06	2.2282	9 12 14.0	15.010
18	23 28 22.68	2.2258	8 57 11.7	15.067
19	23 30 36.16	2.2236	8 42 6.0	15.121
20	23 32 49.51	2.2214	8 26 57.2	15.173
21	23 35 2.73	2.2192	8 11 45.3	15.223
22	23 37 15.82	2.2171	7 56 30.4	15.273
23	23 39 28.78	2.2150	S. 7 41 12.5	15.322

MONDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 41 41.62	2.2131	S. 7 25 51.8	15.368
1	23 43 54.35	2.2112	7 10 28.4	15.413
2	23 46 6.96	2.2093	6 55 2.3	15.456
3	23 48 19.46	2.2075	6 39 33.7	15.497
4	23 50 31.86	2.2057	6 24 2.7	15.537
5	23 52 44.15	2.2040	6 8 29.3	15.576
6	23 54 56.34	2.2024	5 52 53.6	15.613
7	23 57 8.44	2.2009	5 37 15.8	15.648
8	23 59 20.45	2.1994	5 21 35.9	15.681
9	0 1 32.37	2.1980	5 5 54.1	15.713
10	0 3 44.21	2.1967	4 50 10.4	15.743
11	0 5 55.98	2.1955	4 34 24.9	15.772
12	0 8 7.67	2.1943	4 18 37.7	15.799
13	0 10 19.29	2.1932	4 2 49.0	15.824
14	0 12 30.85	2.1921	3 46 58.8	15.848
15	0 14 42.34	2.1910	3 31 7.2	15.871
16	0 16 53.77	2.1901	3 15 14.3	15.892
17	0 19 5.15	2.1893	2 59 20.2	15.910
18	0 21 16.48	2.1885	2 43 25.1	15.927
19	0 23 27.77	2.1877	2 27 29.0	15.943
20	0 25 39.01	2.1870	2 11 31.9	15.957
21	0 27 50.21	2.1864	1 55 34.1	15.969
22	0 30 1.38	2.1860	1 39 35.6	15.980
23	0 32 12.53	2.1856	1 23 36.5	15.990
24	0 34 23.65	2.1852	S. 1 7 36.8	15.998

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 34 23.65	2.1852	S. 1 7 36.8	15.998	0	2 20 5.19	2.2414	N.11 17 38.2	14.427
1	0 36 34.75	2.1848	0 51 36.7	16.003	1	2 22 19.75	2.2439	11 32 1.7	14.355
2	0 38 45.83	2.1846	0 35 36.4	16.007	2	2 24 34.46	2.2463	11 46 20.8	14.281
3	0 40 56.90	2.1844	0 19 35.9	16.009	3	2 26 49.31	2.2489	12 0 35.4	14.205
4	0 43 7.96	2.1843	S. 0 3 35.3	16.011	4	2 29 4.32	2.2515	12 14 45.4	14.128
5	0 45 19.02	2.1842	N. 0 12 25.4	16.011	5	2 31 19.49	2.2541	12 28 50.8	14.051
6	0 47 30.07	2.1842	0 28 26.0	16.008	6	2 33 34.81	2.2567	12 42 51.5	13.972
7	0 49 41.13	2.1844	0 44 26.4	16.004	7	2 35 50.29	2.2593	12 56 47.4	13.890
8	0 51 52.20	2.1846	1 0 26.5	15.998	8	2 38 5.93	2.2620	13 10 38.3	13.806
9	0 54 3.28	2.1848	1 16 26.2	15.991	9	2 40 21.73	2.2647	13 24 24.1	13.721
10	0 56 14.37	2.1851	1 32 25.4	15.982	10	2 42 37.70	2.2675	13 38 4.8	13.636
11	0 58 25.49	2.1855	1 48 24.0	15.971	11	2 44 53.83	2.2703	13 51 40.4	13.549
12	1 0 36.63	2.1859	2 4 21.9	15.958	12	2 47 10.13	2.2731	14 5 10.7	13.460
13	1 2 47.80	2.1864	2 20 19.0	15.945	13	2 49 26.60	2.2759	14 18 35.6	13.369
14	1 4 59.00	2.1870	2 36 15.3	15.930	14	2 51 43.24	2.2787	14 31 55.0	13.277
15	1 7 10.24	2.1876	2 52 10.6	15.912	15	2 54 0.04	2.2815	14 45 8.9	13.185
16	1 9 21.51	2.1883	3 8 4.8	15.893	16	2 56 17.02	2.2844	14 58 17.2	13.091
17	1 11 32.83	2.1891	3 23 57.8	15.872	17	2 58 34.17	2.2873	15 11 19.8	12.994
18	1 13 44.20	2.1899	3 39 49.5	15.850	18	3 0 51.49	2.2902	15 24 16.5	12.896
19	1 15 55.62	2.1908	3 55 39.8	15.827	19	3 3 8.99	2.2931	15 37 7.3	12.797
20	1 18 7.10	2.1917	4 11 28.7	15.802	20	3 5 26.66	2.2960	15 49 52.2	12.698
21	1 20 18.63	2.1928	4 27 16.0	15.774	21	3 7 44.51	2.2989	16 2 31.1	12.597
22	1 22 30.23	2.1939	4 43 1.6	15.746	22	3 10 2.53	2.3018	16 15 3.8	12.493
23	1 24 41.90	2.1950	N. 4 58 45.5	15.716	23	3 12 20.73	2.3047	N.16 27 30.3	12.389
	WEDNESDAY 6.					**FRIDAY 8.**			
0	1 26 53.63	2.1962	N. 5 14 27.5	15.683	0	3 14 39.10	2.3077	N.16 39 50.5	12.283
1	1 29 5.44	2.1975	5 30 7.5	15.649	1	3 16 57.65	2.3107	16 52 4.3	12.177
2	1 31 17.33	2.1988	5 45 45.4	15.614	2	3 19 16.38	2.3136	17 4 11.7	12.068
3	1 33 29.29	2.2001	6 1 21.2	15.577	3	3 21 35.28	2.3165	17 16 12.5	11.958
4	1 35 41.34	2.2016	6 16 54.7	15.538	4	3 23 54.36	2.3194	17 28 6.7	11.848
5	1 37 53.48	2.2032	6 32 25.8	15.498	5	3 26 13.61	2.3223	17 39 54.2	11.736
6	1 40 5.72	2.2047	6 47 54.4	15.456	6	3 28 33.04	2.3252	17 51 35.0	11.623
7	1 42 18.05	2.2063	7 3 20.5	15.413	7	3 30 52.64	2.3282	18 3 8.9	11.508
8	1 44 30.48	2.2079	7 18 43.9	15.368	8	3 33 12.42	2.3311	18 14 35.9	11.393
9	1 46 43.00	2.2096	7 34 4.6	15.321	9	3 35 32.37	2.3339	18 25 56.0	11.276
10	1 48 55.63	2.2114	7 49 22.4	15.273	10	3 37 52.49	2.3367	18 37 9.0	11.157
11	1 51 8.37	2.2133	8 4 37.3	15.223	11	3 40 12.78	2.3396	18 48 14.9	11.037
12	1 53 21.23	2.2152	8 19 49.1	15.171	12	3 42 33.24	2.3424	18 59 13.5	10.917
13	1 55 34.20	2.2171	8 34 57.8	15.118	13	3 44 53.87	2.3452	19 10 4.9	10.796
14	1 57 47.28	2.2190	8 50 3.2	15.063	14	3 47 14.67	2.3480	19 20 49.0	10.672
15	2 0 0.48	2.2211	9 5 5.3	15.007	15	3 49 35.63	2.3507	19 31 25.6	10.548
16	2 2 13.81	2.2232	9 20 4.0	14.948	16	3 51 56.76	2.3535	19 41 54.8	10.424
17	2 4 27.26	2.2253	9 34 59.1	14.888	17	3 54 18.05	2.3562	19 52 16.5	10.298
18	2 6 40.84	2.2274	9 49 50.6	14.827	18	3 56 39.50	2.3588	20 2 30.6	10.171
19	2 8 54.55	2.2297	10 4 38.4	14.765	19	3 59 1.11	2.3614	20 12 37.0	10.042
20	2 11 8.40	2.2320	10 19 22.4	14.700	20	4 1 22.87	2.3640	20 22 35.7	9.913
21	2 13 22.39	2.2343	10 34 2.4	14.634	21	4 3 44.79	2.3666	20 32 26.6	9.783
22	2 15 36.51	2.2366	10 48 38.4	14.567	22	4 6 6.87	2.3692	20 42 9.6	9.652
23	2 17 50.78	2.2390	11 3 10.4	14.498	23	4 8 29.09	2.3716	20 51 41.8	9.520
24	2 20 5.19	2.2414	N.11 17 38.2	14.427	24	4 10 51.46	2.3740	N.21 1 12.0	9.387

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 10 51.46	2.3740	N.21 1 12.0	9.387
1	4 13 13.97	2.3764	21 10 31.2	9.253
2	4 15 36.63	2.3788	21 19 42.3	9.118
3	4 17 59.43	2.3811	21 28 45.3	8.983
4	4 20 22.36	2.3833	21 37 40.2	8.846
5	4 22 45.42	2.3855	21 46 26.8	8.708
6	4 25 8.62	2.3877	21 55 5.1	8.569
7	4 27 31.94	2.3897	22 3 35.1	8.430
8	4 29 55.38	2.3917	22 11 56.7	8.291
9	4 32 18.94	2.3937	22 20 10.0	8.151
10	4 34 42.62	2.3956	22 28 14.8	8.009
11	4 37 6.41	2.3974	22 36 11.1	7.866
12	4 39 30.31	2.3992	22 43 58.8	7.723
13	4 41 54.32	2.4009	22 51 37.9	7.580
14	4 44 18.42	2.4025	22 59 8.4	7.437
15	4 46 42.62	2.4041	23 6 30.3	7.292
16	4 49 6.91	2.4056	23 13 43.5	7.147
17	4 51 31.29	2.4070	23 20 47.9	7.001
18	4 53 55.75	2.4083	23 27 43.6	6.855
19	4 56 20.29	2.4096	23 34 30.5	6.708
20	4 58 44.91	2.4109	23 41 8.5	6.560
21	5 1 9.60	2.4120	23 47 37.7	6.412
22	5 3 34.35	2.4130	23 53 58.0	6.263
23	5 5 59.16	2.4140	N.24 0 9.3	6.114

SUNDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 8 24.03	2.4149	N.24 6 11.7	5.965
1	5 10 48.95	2.4157	24 12 5.1	5.816
2	5 13 13.91	2.4164	24 17 49.6	5.667
3	5 15 38.91	2.4170	24 23 25.1	5.516
4	5 18 3.95	2.4176	24 28 51.5	5.365
5	5 20 29.02	2.4180	24 34 8.9	5.215
6	5 22 54.11	2.4183	24 39 17.3	5.064
7	5 25 19.22	2.4186	24 44 16.6	4.912
8	5 27 44.35	2.4188	24 49 6.8	4.761
9	5 30 9.48	2.4189	24 53 47.9	4.609
10	5 32 34.62	2.4189	24 58 19.9	4.457
11	5 34 59.75	2.4188	25 2 42.8	4.305
12	5 37 24.87	2.4186	25 6 56.5	4.153
13	5 39 49.98	2.4183	25 11 1.1	4.001
14	5 42 15.07	2.4179	25 14 56.6	3.849
15	5 44 40.13	2.4174	25 18 43.0	3.697
16	5 47 5.16	2.4168	25 22 20.2	3.544
17	5 49 30.15	2.4162	25 25 48.3	3.392
18	5 51 55.11	2.4156	25 29 7.2	3.239
19	5 54 20.02	2.4147	25 32 17.0	3.087
20	5 56 44.87	2.4137	25 35 17.7	2.935
21	5 59 9.66	2.4126	25 38 9.2	2.783
22	6 1 34.38	2.4115	25 40 51.6	2.631
23	6 3 59.04	2.4103	25 43 24.9	2.480
24	6 6 23.62	2.4090	N.25 45 49.2	2.329

MONDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 6 23.62	2.4090	N.25 45 49.2	2.329
1	6 8 48.12	2.4076	25 48 4.4	2.177
2	6 11 12.53	2.4060	25 50 10.5	2.026
3	6 13 36.84	2.4043	25 52 7.5	1.875
4	6 16 1.05	2.4026	25 53 55.5	1.725
5	6 18 25.16	2.4009	25 55 34.5	1.574
6	6 20 49.16	2.3990	25 57 4.4	1.424
7	6 23 13.04	2.3969	25 58 25.4	1.275
8	6 25 36.79	2.3948	25 59 37.4	1.125
9	6 28 0.42	2.3927	26 0 40.4	0.976
10	6 30 23.92	2.3905	26 1 34.5	0.827
11	6 32 47.28	2.3881	26 2 19.7	0.679
12	6 35 10.49	2.3856	26 2 56.0	0.532
13	6 37 33.55	2.3831	26 3 23.5	0.385
14	6 39 56.46	2.3805	26 3 42.2	0.238
15	6 42 19.21	2.3777	26 3 52.0	+ 0.091
16	6 44 41.79	2.3749	26 3 53.1	− 0.054
17	6 47 4.20	2.3721	26 3 45.5	0.200
18	6 49 26.44	2.3692	26 3 29.1	0.345
19	6 51 48.50	2.3661	26 3 4.1	0.488
20	6 54 10.37	2.3629	26 2 30.5	0.632
21	6 56 32.05	2.3597	26 1 48.3	0.775
22	6 58 53.54	2.3564	26 0 57.5	0.918
23	7 1 14.82	2.3530	N.25 59 58.1	1.061

TUESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 3 35.90	2.3496	N.25 58 50.2	1.202
1	7 5 56.77	2.3461	25 57 33.9	1.342
2	7 8 17.43	2.3425	25 56 9.2	1.482
3	7 10 37.87	2.3388	25 54 36.1	1.621
4	7 12 58.08	2.3350	25 52 54.7	1.759
5	7 15 18.07	2.3312	25 51 5.0	1.896
6	7 17 37.83	2.3273	25 49 7.1	2.033
7	7 19 57.35	2.3233	25 47 1.0	2.170
8	7 22 16.63	2.3193	25 44 46.7	2.306
9	7 24 35.67	2.3153	25 42 24.3	2.440
10	7 26 54.47	2.3112	25 39 53.9	2.574
11	7 29 13.01	2.3069	25 37 15.4	2.708
12	7 31 31.30	2.3026	25 34 28.9	2.841
13	7 33 49.33	2.2983	25 31 34.5	2.972
14	7 36 7.10	2.2940	25 28 32.3	3.102
15	7 38 24.61	2.2897	25 25 22.2	3.232
16	7 40 41.86	2.2852	25 22 4.4	3.362
17	7 42 58.83	2.2806	25 18 38.8	3.491
18	7 45 15.53	2.2760	25 15 5.5	3.618
19	7 47 31.95	2.2714	25 11 24.6	3.744
20	7 49 48.10	2.2668	25 7 36.2	3.870
21	7 52 3.97	2.2621	25 3 40.2	3.995
22	7 54 19.55	2.2573	24 59 36.8	4.119
23	7 56 34.85	2.2526	24 55 26.0	4.242
24	7 58 49.86	2.2478	N.24 51 7.8	4.364

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 58 49.86	2.2478	N.24 51 7.8	4.364
1	8 1 4.58	2.2429	24 46 42.3	4.485
2	8 3 19.01	2.2380	24 42 9.6	4.606
3	8 5 33.14	2.2330	24 37 29.6	4.727
4	8 7 46.97	2.2281	24 32 42.4	4.845
5	8 10 0.51	2.2232	24 27 48.2	4.962
6	8 12 13.75	2.2182	24 22 47.0	5.079
7	8 14 26.69	2.2132	24 17 38.8	5.195
8	8 16 39.33	2.2081	24 12 23.6	5.310
9	8 18 51.66	2.2030	24 7 1.6	5.424
10	8 21 3.69	2.1979	24 1 32.8	5.537
11	8 23 15.41	2.1927	23 55 57.2	5.649
12	8 25 26.82	2.1876	23 50 14.9	5.760
13	8 27 37.92	2.1825	23 44 26.0	5.870
14	8 29 48.72	2.1774	23 38 30.5	5.980
15	8 31 59.21	2.1722	23 32 28.4	6.089
16	8 34 9.39	2.1671	23 26 19.8	6.197
17	8 36 19.26	2.1619	23 20 4.8	6.303
18	8 38 28.82	2.1568	23 13 43.5	6.408
19	8 40 38.07	2.1516	23 7 15.9	6.513
20	8 42 47.01	2.1463	23 0 42.0	6.617
21	8 44 55.63	2.1411	22 54 1.9	6.719
22	8 47 3.94	2.1359	22 47 15.7	6.821
23	8 49 11.94	2.1307	N.22 40 23.4	6.922

THURSDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 51 19.63	2.1255	N.22 33 25.0	7.022
1	8 53 27.00	2.1203	22 26 20.7	7.121
2	8 55 34.07	2.1152	22 19 10.5	7.219
3	8 57 40.83	2.1101	22 11 54.4	7.317
4	8 59 47.28	2.1049	22 4 32.5	7.413
5	9 1 53.42	2.0997	21 57 4.8	7.508
6	9 3 59.25	2.0946	21 49 31.5	7.602
7	9 6 4.77	2.0895	21 41 52.6	7.696
8	9 8 9.99	2.0844	21 34 8.0	7.789
9	9 10 14.90	2.0793	21 26 17.9	7.881
10	9 12 19.51	2.0743	21 18 22.3	7.972
11	9 14 23.82	2.0692	21 10 21.3	8.061
12	9 16 27.82	2.0642	21 2 15.0	8.149
13	9 18 31.52	2.0592	20 54 3.4	8.237
14	9 20 34.92	2.0542	20 45 46.5	8.325
15	9 22 38.03	2.0493	20 37 24.4	8.412
16	9 24 40.84	2.0443	20 28 57.1	8.497
17	9 26 43.35	2.0394	20 20 24.8	8.581
18	9 28 45.57	2.0345	20 11 47.4	8.665
19	9 30 47.49	2.0297	20 3 5.0	8.747
20	9 32 49.13	2.0249	19 54 17.7	8.828
21	9 34 50.48	2.0201	19 45 25.6	8.909
22	9 36 51.54	2.0154	19 36 28.6	8.990
23	9 38 52.32	2.0107	19 27 26.8	9.070
24	9 40 52.82	2.0060	N.19 18 20.2	9.148

FRIDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 40 52.82	2.0060	N.19 18 20.2	9.148
1	9 42 53.04	2.0013	19 9 9.0	9.225
2	9 44 52.98	1.9967	18 59 53.2	9.302
3	9 46 52.64	1.9921	18 50 32.8	9.377
4	9 48 52.03	1.9876	18 41 7.9	9.452
5	9 50 51.15	1.9831	18 31 38.5	9.527
6	9 52 50.00	1.9786	18 22 4.6	9.601
7	9 54 48.58	1.9742	18 12 26.4	9.673
8	9 56 46.90	1.9698	18 2 43.9	9.744
9	9 58 44.96	1.9655	17 52 57.1	9.815
10	10 0 42.76	1.9612	17 43 6.1	9.885
11	10 2 40.30	1.9569	17 33 10.9	9.954
12	10 4 37.58	1.9526	17 23 11.6	10.022
13	10 6 34.61	1.9485	17 13 8.2	10.090
14	10 8 31.40	1.9445	17 3 0.8	10.158
15	10 10 27.95	1.9404	16 52 49.3	10.224
16	10 12 24.25	1.9363	16 42 33.9	10.288
17	10 14 20.31	1.9323	16 32 14.7	10.352
18	10 16 16.13	1.9284	16 21 51.6	10.416
19	10 18 11.72	1.9246	16 11 24.7	10.479
20	10 20 7.08	1.9208	16 0 54.1	10.542
21	10 22 2.21	1.9170	15 50 19.7	10.603
22	10 23 57.12	1.9133	15 39 41.7	10.663
23	10 25 51.81	1.9096	N.15 29 0.1	10.723

SATURDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 27 46.27	1.9059	N.15 18 14.9	10.782
1	10 29 40.52	1.9024	15 7 26.2	10.841
2	10 31 34.56	1.8989	14 56 34.0	10.898
3	10 33 28.39	1.8955	14 45 38.4	10.955
4	10 35 22.02	1.8921	14 34 39.4	11.012
5	10 37 15.44	1.8887	14 23 37.0	11.068
6	10 39 8.66	1.8854	14 12 31.3	11.123
7	10 41 1.69	1.8822	14 1 22.3	11.177
8	10 42 54.53	1.8791	13 50 10.1	11.229
9	10 44 47.18	1.8759	13 38 54.8	11.281
10	10 46 39.64	1.8728	13 27 36.4	11.333
11	10 48 31.91	1.8697	13 16 14.9	11.384
12	10 50 24.00	1.8667	13 4 50.3	11.435
13	10 52 15.92	1.8639	12 53 22.7	11.484
14	10 54 7.67	1.8611	12 41 52.2	11.533
15	10 55 59.25	1.8583	12 30 18.7	11.582
16	10 57 50.66	1.8556	12 18 42.3	11.630
17	10 59 41.92	1.8530	12 7 3.1	11.677
18	11 1 33.02	1.8504	11 55 21.1	11.723
19	11 3 23.97	1.8478	11 43 36.4	11.768
20	11 5 14.76	1.8452	11 31 49.0	11.813
21	11 7 5.40	1.8428	11 19 58.8	11.858
22	11 8 55.90	1.8406	11 8 6.0	11.902
23	11 10 46.27	1.8383	10 56 10.6	11.944
24	11 12 36.50	1.8361	N.10 44 12.7	11.986

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 12 36.50	1.8361	N.10 44 12.7	11.986
1	11 14 26.60	1.8339	10 32 12.3	12.028
2	11 16 16.57	1.8318	10 20 9.4	12.069
3	11 18 6.41	1.8297	10 8 4.0	12.110
4	11 19 56.13	1.8277	9 55 56.2	12.149
5	11 21 45.73	1.8258	9 43 46.1	12.187
6	11 23 35.22	1.8239	9 31 33.8	12.224
7	11 25 24.60	1.8222	9 19 19.2	12.262
8	11 27 13.88	1.8204	9 7 2.3	12.300
9	11 29 3.05	1.8187	8 54 43.2	12.337
10	11 30 52.12	1.8171	8 42 21.9	12.372
11	11 32 41.10	1.8156	8 29 58.5	12.406
12	11 34 30.00	1.8142	8 17 33.1	12.440
13	11 36 18.81	1.8127	8 5 5.7	12.474
14	11 38 7.53	1.8113	7 52 36.2	12.508
15	11 39 56.17	1.8101	7 40 4.7	12.541
16	11 41 44.74	1.8089	7 27 31.3	12.572
17	11 43 33.24	1.8077	7 14 56.1	12.603
18	11 45 21.66	1.8065	7 2 19.0	12.633
19	11 47 10.02	1.8056	6 49 40.1	12.663
20	11 48 58.33	1.8047	6 36 59.4	12.693
21	11 50 46.58	1.8038	6 24 17.0	12.721
22	11 52 34.78	1.8029	6 11 32.9	12.748
23	11 54 22.93	1.8021	N. 5 58 47.2	12.776

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 56 11.03	1.8013	N. 5 45 59.8	12.803
1	11 57 59.09	1.8007	5 33 10.8	12.828
2	11 59 47.12	1.8002	5 20 20.4	12.853
3	12 1 35.12	1.7997	5 7 28.5	12.878
4	12 3 23.09	1.7993	4 54 35.1	12.902
5	12 5 11.04	1.7990	4 41 40.3	12.925
6	12 6 58.97	1.7987	4 28 44.1	12.948
7	12 8 46.88	1.7984	4 15 46.5	12.970
8	12 10 34.78	1.7983	4 2 47.7	12.991
9	12 12 22.68	1.7982	3 49 47.6	13.012
10	12 14 10.57	1.7982	3 36 46.3	13.032
11	12 15 58.46	1.7982	3 23 43.8	13.051
12	12 17 46.35	1.7983	3 10 40.2	13.069
13	12 19 34.25	1.7985	2 57 35.5	13.087
14	12 21 22.17	1.7987	2 44 29.7	13.105
15	12 23 10.10	1.7990	2 31 22.9	13.122
16	12 24 58.05	1.7994	2 18 15.1	13.137
17	12 26 46.03	1.7999	2 5 6.4	13.152
18	12 28 34.04	1.8004	1 51 56.8	13.167
19	12 30 22.08	1.8010	1 38 46.3	13.181
20	12 32 10.16	1.8017	1 25 35.0	13.194
21	12 33 58.28	1.8024	1 12 23.0	13.207
22	12 35 46.45	1.8031	0 59 10.2	13.219
23	12 37 34.66	1.8039	0 45 56.7	13.230
24	12 39 22.92	1.8048	N. 0 32 42.6	13.240

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 39 22.92	1.8048	N. 0 32 42.6	13.240
1	12 41 11.24	1.8059	0 19 27.9	13.250
2	12 42 59.63	1.8070	N. 0 6 12.6	13.259
3	12 44 48.08	1.8081	S. 0 7 3.2	13.267
4	12 46 36.60	1.8093	0 20 19.5	13.275
5	12 48 25.20	1.8105	0 33 36.2	13.282
6	12 50 13.87	1.8118	0 46 53.3	13.288
7	12 52 2.62	1.8132	1 0 10.8	13.294
8	12 53 51.46	1.8147	1 13 28.6	13.298
9	12 55 40.39	1.8162	1 26 46.6	13.302
10	12 57 29.41	1.8179	1 40 4.8	13.305
11	12 59 18.54	1.8196	1 53 23.2	13.307
12	13 1 7.77	1.8213	2 6 41.7	13.309
13	13 2 57.10	1.8232	2 20 0.3	13.310
14	13 4 46.55	1.8251	2 33 18.9	13.310
15	13 6 36.11	1.8270	2 46 37.5	13.309
16	13 8 25.79	1.8290	2 59 56.0	13.308
17	13 10 15.59	1.8311	3 13 14.4	13.306
18	13 12 5.52	1.8332	3 26 32.7	13.303
19	13 13 55.58	1.8355	3 39 50.8	13.299
20	13 15 45.78	1.8378	3 53 8.6	13.294
21	13 17 36.11	1.8401	4 6 26.1	13.288
22	13 19 26.59	1.8426	4 19 43.2	13.282
23	13 21 17.22	1.8451	S. 4 33 0.0	13.276

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 23 8.00	1.8476	S. 4 46 16.3	13.268
1	13 24 58.93	1.8502	4 59 32.1	13.259
2	13 26 50.03	1.8530	5 12 47.4	13.249
3	13 28 41.29	1.8558	5 26 2.0	13.238
4	13 30 32.72	1.8586	5 39 16.0	13.227
5	13 32 24.32	1.8615	5 52 29.3	13.215
6	13 34 16.10	1.8645	6 5 41.8	13.202
7	13 36 8.06	1.8676	6 18 53.5	13.188
8	13 38 0.21	1.8707	6 32 4.3	13.173
9	13 39 52.54	1.8738	6 45 14.3	13.158
10	13 41 45.06	1.8770	6 58 23.3	13.141
11	13 43 37.78	1.8804	7 11 31.2	13.124
12	13 45 30.71	1.8838	7 24 38.1	13.106
13	13 47 23.84	1.8872	7 37 43.9	13.086
14	13 49 17.18	1.8907	7 50 48.4	13.065
15	13 51 10.73	1.8942	8 3 51.7	13.044
16	13 53 4.49	1.8979	8 16 53.7	13.022
17	13 54 58.48	1.9017	8 29 54.3	12.999
18	13 56 52.69	1.9054	8 42 53.5	12.975
19	13 58 47.13	.9092	8 55 51.3	12.950
20	14 0 41.80	1.9132	9 8 47.5	12.923
21	14 2 36.71	1.9172	9 21 42.1	12.896
22	14 4 31.86	1.9212	9 34 35.0	12.868
23	14 6 27.25	1.9252	9 47 26.2	12.839
24	14 8 22.89	1.9294	S.10 0 15.7	12.810

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 8 22.89	1.9294	S. 10 0 15.7	12.810
1	14 10 18.78	1.9337	10 13 3.4	12.778
2	14 12 14.93	1.9380	10 25 49.1	12.745
3	14 14 11.34	1.9423	10 38 32.8	12.712
4	14 16 8.01	1.9467	10 51 14.5	12.678
5	14 18 4.95	1.9512	11 3 54.2	12.643
6	14 20 2.15	1.9557	11 16 31.7	12.607
7	14 21 59.63	1.9603	11 29 7.0	12.569
8	14 23 57.39	1.9650	11 41 40.0	12.530
9	14 25 55.43	1.9698	11 54 10.6	12.490
10	14 27 53.76	1.9746	12 6 38.8	12.450
11	14 29 52.38	1.9794	12 19 4.6	12.408
12	14 31 51.28	1.9842	12 31 27.8	12.365
13	14 33 50.48	1.9892	12 43 48.4	12.321
14	14 35 49.98	1.9942	12 56 6.3	12.276
15	14 37 49.78	1.9993	13 8 21.5	12.229
16	14 39 49.89	2.0044	13 20 33.8	12.181
17	14 41 50.31	2.0095	13 32 43.2	12.132
18	14 43 51.03	2.0147	13 44 49.7	12.082
19	14 45 52.07	2.0200	13 56 53.1	12.031
20	14 47 53.43	2.0253	14 8 53.4	11.979
21	14 49 55.11	2.0307	14 20 50.6	11.926
22	14 51 57.12	2.0362	14 32 44.5	11.871
23	14 53 59.45	2.0416	S. 14 44 35.1	11.814

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 56 2.11	2.0472	S. 14 56 22.2	11.757
1	14 58 5.11	2.0527	15 8 5.9	11.699
2	15 0 8.44	2.0583	15 19 46.1	11.639
3	15 2 12.11	2.0640	15 31 22.6	11.578
4	15 4 16.12	2.0697	15 42 55.4	11.516
5	15 6 20.48	2.0755	15 54 24.5	11.453
6	15 8 25.18	2.0813	16 5 49.7	11.388
7	15 10 30.23	2.0871	16 17 11.0	11.322
8	15 12 35.63	2.0930	16 28 28.3	11.254
9	15 14 41.39	2.0990	16 39 41.5	11.180
10	15 16 47.51	2.1049	16 50 50.6	11.116
11	15 18 53.98	2.1108	17 1 55.4	11.044
12	15 21 0.81	2.1168	17 12 55.9	10.972
13	15 23 8.00	2.1229	17 23 52.0	10.898
14	15 25 15.56	2.1291	17 34 43.6	10.823
15	15 27 23.49	2.1352	17 46 30.7	10.747
16	15 29 31.78	2.1414	17 56 13.2	10.668
17	15 31 40.45	2.1476	18 6 50.9	10.588
18	15 33 49.49	2.1538	18 17 23.8	10.506
19	15 35 58.90	2.1600	18 27 51.9	10.427
20	15 38 8.69	2.1662	18 38 15.0	10.343
21	15 40 18.85	2.1725	18 48 33.0	10.258
22	15 42 29.39	2.1788	18 58 45.9	10.172
23	15 44 40.31	2.1851	19 8 53.6	10.084
24	15 46 51.60	2.1914	S. 19 18 56.0	9.996

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 46 51.60	2.1914	S. 19 18 56.0	9.996
1	15 49 3.27	2.1978	19 28 53.1	9.906
2	15 51 15.33	2.2042	19 38 44.7	9.813
3	15 53 27.77	2.2105	19 48 30.7	9.720
4	15 55 40.59	2.2169	19 58 11.1	9.626
5	15 57 53.80	2.2233	20 7 45.8	9.530
6	16 0 7.39	2.2297	20 17 14.7	9.433
7	16 2 21.36	2.2361	20 26 37.8	9.335
8	16 4 35.72	2.2425	20 35 54.9	9.234
9	16 6 50.46	2.2488	20 45 5.9	9.133
10	16 9 5.58	2.2552	20 54 10.8	9.031
11	16 11 21.09	2.2617	21 3 9.6	8.927
12	16 13 36.98	2.2680	21 12 2.1	8.822
13	16 15 53.25	2.2743	21 20 48.2	8.714
14	16 18 9.90	2.2807	21 29 27.8	8.606
15	16 20 26.94	2.2871	21 38 0.9	8.497
16	16 22 44.36	2.2934	21 46 27.4	8.385
17	16 25 2.15	2.2997	21 54 47.1	8.272
18	16 27 20.32	2.3060	22 3 0.0	8.158
19	16 29 38.87	2.3122	22 11 6.1	8.043
20	16 31 57.79	2.3185	22 19 5.2	7.926
21	16 34 17.09	2.3247	22 26 57.2	7.808
22	16 36 36.76	2.3309	22 34 42.1	7.689
23	16 38 56.80	2.3370	S. 22 42 19.9	7.569

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 41 17.20	2.3431	S. 22 49 50.4	7.447
1	16 43 37.97	2.3492	22 57 13.5	7.323
2	16 45 59.10	2.3553	23 4 29.2	7.198
3	16 48 20.60	2.3612	23 11 37.3	7.072
4	16 50 42.45	2.3671	23 18 37.8	6.945
5	16 53 4.65	2.3730	23 25 30.7	6.817
6	16 55 27.21	2.3789	23 32 15.8	6.686
7	16 57 50.12	2.3847	23 38 53.0	6.555
8	17 0 13.37	2.3904	23 45 22.4	6.423
9	17 2 36.96	2.3960	23 51 43.8	6.289
10	17 5 0.89	2.4017	23 57 57.1	6.154
11	17 7 25.16	2.4073	24 4 2.3	6.018
12	17 9 49.76	2.4127	24 9 59.3	5.881
13	17 12 14.68	2.4180	24 15 48.0	5.742
14	17 14 39.92	2.4234	24 21 28.3	5.602
15	17 17 5.49	2.4287	24 27 0.2	5.461
16	17 19 31.37	2.4338	24 32 23.6	5.319
17	17 21 57.55	2.4389	24 37 38.5	5.176
18	17 24 24.04	2.4440	24 42 44.7	5.031
19	17 26 50.83	2.4489	24 47 42.2	4.886
20	17 29 17.91	2.4537	24 52 31.0	4.739
21	17 31 45.28	2.4585	24 57 10.9	4.591
22	17 34 12.93	2.4632	25 1 41.9	4.442
23	17 36 40.87	2.4679	25 6 4.0	4.292
24	17 39 9.08	2.4723	S. 25 10 17.0	4.141

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 39 9.08	2.4723	S.25 10 17.0	4.141
1	17 41 37.55	2.4767	25 14 20.9	3.990
2	17 44 6.28	2.4810	25 18 15.8	3.838
3	17 46 35.27	2.4652	25 22 1.5	3.684
4	17 49 4.51	2.4893	25 25 37.9	3.529
5	17 51 33.99	2.4932	25 29 5.0	3.374
6	17 54 3.70	2.4971	25 32 22.8	3.218
7	17 56 33.64	2.5008	25 35 31.2	3.061
8	17 59 3.80	2.5045	25 38 30.1	2.903
9	18 1 34.18	2.5081	25 41 19.5	2.744
10	18 4 4.77	2.5115	25 43 59.4	2.584
11	18 6 35.56	2.5147	25 46 29.6	2.423
12	18 9 6.54	2.5179	25 48 50.2	2.263
13	18 11 37.71	2.5210	25 51 1.2	2.102
14	18 14 9.06	2.5239	25 53 2.4	1.939
15	18 16 40.58	2.5267	25 54 53.9	1.776
16	18 19 12.26	2.5294	25 56 35.6	1.612
17	18 21 44.11	2.5321	25 58 7.4	1.448
18	18 24 16.11	2.5345	25 59 29.4	1.284
19	18 26 48.25	2.5367	26 0 41.5	1.119
20	18 29 20.52	2.5389	26 1 43.7	0.953
21	18 31 52.92	2.5410	26 2 35.9	0.787
22	18 34 25.44	2.5428	26 3 18.1	0.621
23	18 36 58.06	2.5446	S.26 3 50.4	0.455

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 39 30.79	2.5463	S.26 4 12.7	0.288
1	18 42 3.62	2.5478	26 4 24.9	− 0.120
2	18 44 36.53	2.5492	26 4 27.1	+ 0.048
3	18 47 9.52	2.5504	26 4 19.2	0.216
4	18 49 42.58	2.5516	26 4 1.2	0.384
5	18 52 15.71	2.5526	26 3 33.1	0.553
6	18 54 48.89	2.5534	26 2 54.8	0.722
7	18 57 22.11	2.5541	26 2 6.4	0.891
8	18 59 55.38	2.5547	26 1 7.9	1.059
9	19 2 28.68	2.5552	25 59 59.3	1.228
10	19 5 2.00	2.5554	25 58 40.5	1.397
11	19 7 35.33	2.5556	25 57 11.6	1.566
12	19 10 8.67	2.5556	25 55 32.6	1.735
13	19 12 42.00	2.5555	25 53 43.4	1.904
14	19 15 15.33	2.5553	25 51 44.1	2.072
15	19 17 48.64	2.5550	25 49 34.7	2.241
16	19 20 21.93	2.5545	25 47 15.2	2.410
17	19 22 55.18	2.5538	25 44 45.5	2.579
18	19 25 28.39	2.5531	25 42 5.7	2.747
19	19 28 1.55	2.5522	25 39 15.9	2.914
20	19 30 34.66	2.5512	25 36 16.0	3.082
21	19 33 7.70	2.5501	25 33 6.1	3.249
22	19 35 40.67	2.5488	25 29 46.1	3.416
23	19 38 13.56	2.5475	25 26 16.2	3.582
24	19 40 46.37	2.5460	S.25 22 36.3	3.748

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 40 46.37	2.5460	S.25 22 36.3	3.748
1	19 43 19.08	2.5444	25 18 46.4	3.914
2	19 45 51.69	2.5427	25 14 46.6	4.079
3	19 48 24.20	2.5408	25 10 36.9	4.243
4	19 50 56.59	2.5388	25 6 17.4	4.408
5	19 53 28.86	2.5367	25 1 48.0	4.572
6	19 56 1.00	2.5345	24 57 8.8	4.735
7	19 58 33.00	2.5322	24 52 19.8	4.897
8	20 1 4.86	2.5298	24 47 21.1	5.058
9	20 3 36.58	2.5274	24 42 12.8	5.219
10	20 6 8.15	2.5247	24 36 54.8	5.380
11	20 8 39.55	2.5219	24 31 27.2	5.539
12	20 11 10.78	2.5191	24 25 50.1	5.698
13	20 13 41.84	2.5162	24 20 3.5	5.856
14	20 16 12.73	2.5132	24 14 7.4	6.014
15	20 18 43.43	2.5101	24 8 1.8	6.171
16	20 21 13.94	2.5069	24 1 46.9	6.326
17	20 23 44.26	2.5037	23 55 22.7	6.481
18	20 26 14.39	2.5004	23 48 49.2	6.635
19	20 28 44.31	2.4969	23 42 6.5	6.787
20	20 31 14.02	2.4933	23 35 14.7	6.939
21	20 33 43.51	2.4897	23 28 13.8	7.090
22	20 36 12.79	2.4861	23 21 3.9	7.241
23	20 38 41.84	2.4824	S.23 13 44.9	7.391

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 41 10.67	2.4786	S.23 6 17.0	7.538
1	20 43 39.27	2.4747	22 58 40.3	7.685
2	20 46 7.63	2.4707	22 50 54.8	7.832
3	20 48 35.75	2.4667	22 43 0.5	7.977
4	20 51 3.63	2.4626	22 34 57.6	8.120
5	20 53 31.26	2.4585	22 26 46.1	8.262
6	20 55 58.65	2.4544	22 18 26.2	8.403
7	20 58 25.79	2.4502	22 9 57.8	8.543
8	21 0 52.67	2.4459	22 1 21.0	8.683
9	21 3 19.29	2.4415	21 52 35.8	8.822
10	21 5 45.65	2.4372	21 43 42.4	8.958
11	21 8 11.75	2.4328	21 24 40.8	9.094
12	21 10 37.59	2.4284	21 25 31.1	9.228
13	21 13 3.16	2.4239	21 16 13.4	9.362
14	21 15 28.46	2.4194	21 6 47.7	9.493
15	21 17 53.49	2.4148	20 57 14.2	9.623
16	21 20 18.24	2.4102	20 47 32.9	9.753
17	21 22 42.72	2.4057	20 37 43.8	9.882
18	21 25 6.93	2.4012	20 27 47.1	10.008
19	21 27 30.86	2.3965	20 17 42.8	10.134
20	21 29 54.51	2.3918	20 7 31.0	10.257
21	21 32 17.88	2.3872	19 57 11.9	10.379
22	21 34 40.97	2.3826	19 46 45.5	10.501
23	21 37 3.79	2.3780	19 33 11.8	10.623
24	21 39 26.33	2.3733	S.19 25 30.8	10.742

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 39 26.33	2.3733	S. 19 25 30.8	10.742
1	21 41 48.59	2.3686	19 14 42.8	10.858
2	21 44 10.56	2.3639	19 3 47.8	10.974
3	21 46 32.25	2.3592	18 52 45.9	11.089
4	21 48 53.66	2.3545	18 41 37.1	11.202
5	21 51 14.79	2.3498	18 30 21.6	11.314
6	21 53 35.64	2.3452	18 18 59.4	11.425
7	21 55 56.21	2.3405	18 7 30.6	11.534
8	21 58 16.50	2.3358	17 55 55.3	11.642
9	22 0 36.51	2.3312	17 44 13.6	11.748
10	22 2 56.24	2.3266	17 32 25.6	11.853
11	22 5 15.70	2.3220	17 20 31.3	11.956
12	22 7 34.88	2.3174	17 8 30.9	12.058
13	22 9 53.79	2.3128	16 56 24.4	12.159
14	22 12 12.42	2.3082	16 44 11.8	12.258
15	22 14 30.78	2.3037	16 31 53.4	12.355
16	22 16 48.87	2.2993	16 19 29.2	12.452
17	22 19 6.70	2.2949	16 6 59.2	12.547
18	22 21 24.26	2.2905	15 54 23.6	12.640
19	22 23 41.56	2.2861	15 41 42.4	12.732
20	22 25 58.59	2.2817	15 28 55.7	12.822
21	22 28 15.36	2.2774	15 16 3.7	12.911
22	22 30 31.87	2.2731	15 3 6.4	12.998
23	22 32 48.13	2.2688	S. 14 50 3.9	13.085

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 35 4.13	2.2646	S. 14 36 56.2	13.170
1	22 37 19.88	2.2605	14 23 43.5	13.253
2	22 39 35.39	2.2564	14 10 25.8	13.335
3	22 41 50.65	2.2523	13 57 3.3	13.415
4	22 44 5.67	2.2483	13 43 36.0	13.494
5	22 46 20.45	2.2443	13 30 4.0	13.572
6	22 48 34.99	2.2404	13 16 27.4	13.648
7	22 50 49.30	2.2366	13 2 46.3	13.722
8	22 53 3.38	2.2327	12 49 0.8	13.795
9	22 55 17.22	2.2289	12 35 10.9	13.867
10	22 57 30.84	2.2252	12 21 16.8	13.937
11	22 59 44.24	2.2216	12 7 18.5	14.006
12	23 1 57.43	2.2180	11 53 16.1	14.073
13	23 4 10.40	2.2144	11 39 9.7	14.139
14	23 6 23.16	2.2109	11 24 59.4	14.203
15	23 8 35.71	2.2075	11 10 45.4	14.264
16	23 10 48.06	2.2041	10 56 27.7	14.326
17	23 13 0.21	2.2008	10 42 6.3	14.387
18	23 15 12.16	2.1976	10 27 41.2	14.446
19	23 17 23.92	2.1944	10 13 12.7	14.503
20	23 19 35.49	2.1912	9 58 40.9	14.558
21	23 21 46.87	2.1882	9 44 5.8	14.612
22	23 23 58.07	2.1852	9 29 27.5	14.664
23	23 26 9.10	2.1823	9 14 46.1	14.716
24	23 28 19.95	2.1794	S. 9 0 1.6	14.766

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 28 19.95	2.1794	S. 9 0 1.6	14.766
1	23 30 30.63	2.1767	8 45 14.2	14.814
2	23 32 41.15	2.1740	8 30 23.9	14.861
3	23 34 51.51	2.1713	8 15 30.9	14.906
4	23 37 1.71	2.1687	8 0 35.2	14.950
5	23 39 11.76	2.1662	7 45 36.9	14.992
6	23 41 21.66	2.1638	7 30 36.1	15.033
7	23 43 31.42	2.1615	7 15 32.9	15.073
8	23 45 41.04	2.1592	7 0 27.3	15.112
9	23 47 50.52	2.1569	6 45 19.5	15.148
10	23 49 59.87	2.1548	6 30 9.5	15.184
11	23 52 9.10	2.1527	6 14 57.4	15.217
12	23 54 18.20	2.1507	5 59 43.4	15.249
13	23 56 27.18	2.1488	5 44 27.5	15.281
14	23 58 36.05	2.1470	5 29 9.7	15.311
15	0 0 44.82	2.1452	5 13 50.2	15.339
16	0 2 53.48	2.1435	4 58 29.0	15.366
17	0 5 2.04	2.1418	4 43 6.3	15.390
18	0 7 10.50	2.1402	4 27 42.2	15.414
19	0 9 18.87	2.1388	4 12 16.7	15.437
20	0 11 27.16	2.1375	3 56 49.8	15.458
21	0 13 35.37	2.1361	3 41 21.7	15.478
22	0 15 43.50	2.1348	3 25 52.5	15.496
23	0 17 51.55	2.1336	S. 3 10 22.2	15.512

MONDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 19 59.53	2.1325	S. 2 54 51.0	15.527

PHASES OF THE MOON.

		d	h	m
☾ Last Quarter . .	May	1	1	51.1
● New Moon		7	18	15.5
☽ First Quarter. . . .		15	7	4.4
○ Full Moon		23	6	25.9
☾ Last Quarter		30	6	54.4

		d	h
☾ Perigee	May	4	20.6
☾ Apogee		16	16.9
☾ Perigee		31	9.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Spica	W.	107° 13′ 25″	2359	108° 57′ 58″	2352	110° 42′ 42″	2344	112° 27′ 37″	2336
	Antares	W.	61 19 47	2352	63 4 31	2344	64 49 27	2335	66 34 36	2326
	α Pegasi	E.	47 58 42	3165	46 31 51	3206	45 5 49	3253	43 40 43	3307
	Venus	E.	54 59 12	2728	53 23 9	2719	51 46 55	2710	50 10 29	2701
	Sun	E.	91 0 20	2650	89 22 33	2641	87 44 34	2632	86 6 23	2623
2	Antares	W.	75 23 28	2284	77 9 51	2277	78 56 25	2269	80 43 10	2262
	Venus	E.	42 5 27	2660	40 27 54	2653	38 50 11	2646	37 12 18	2639
	Sun	E.	77 52 25	2580	76 13 2	2572	74 33 28	2564	72 53 43	2556
3	Antares	W.	89 39 32	2228	91 27 18	2223	93 15 12	2217	95 3 14	2212
	α Aquilæ	W.	50 17 11	3748	51 33 7	3667	52 50 29	3592	54 9 12	3525
	Venus	E.	29 0 42	2610	27 22 1	2606	25 43 14	2602	24 4 22	2601
	Sun	E.	64 32 24	2520	62 51 39	2515	61 10 46	2508	59 29 44	2502
4	Antares	W.	104 5 14	2190	105 53 56	2187	107 42 43	2185	109 31 33	2182
	α Aquilæ	W.	60 59 39	3264	62 24 33	3225	63 50 13	3189	65 16 35	3157
	Sun	E.	51 2 45	2480	49 21 3	2476	47 39 16	2472	45 57 24	2470
5	α Aquilæ	W.	72 36 55	3040	74 6 18	3024	75 36 1	3011	77 6 0	3000
	Fomalhaut	W.	37 56 53	2625	39 35 14	2589	41 14 24	2559	42 54 15	2534
	Sun	E.	37 27 27	2465	35 45 24	2466	34 3 23	2467	32 21 23	2468
6	α Aquilæ	W.	84 38 34	2974	86 9 19	2975	87 40 3	2977	89 10 44	2981
	Fomalhaut	W.	51 20 42	2455	53 2 59	2446	54 45 28	2438	56 28 8	2433
	α Pegasi	W.	37 28 6	3470	38 49 4	3373	40 11 51	3291	41 36 13	3220
	Sun	E.	23 52 15	2487	22 10 43	2492	20 29 19	2500	18 48 6	2509
9	Sun	W.	16 6 44	2741	17 42 29	2752	19 18 0	2765	20 53 14	2779
	Pollux	E.	47 24 57	2416	45 41 45	2431	43 58 54	2446	42 16 25	2461
	Regulus	E.	83 39 6	2420	81 56 0	2435	80 13 15	2450	78 30 51	2465
10	Sun	W.	28 44 34	2857	30 17 48	2873	31 50 42	2889	33 23 15	2906
	Pollux	E.	33 49 35	2544	32 9 23	2562	30 29 36	2580	28 50 14	2599
	Regulus	E.	70 4 16	2543	68 24 3	2559	66 44 12	2576	65 4 44	2592
11	Sun	W.	41 0 38	2990	42 31 3	3007	44 1 7	3025	45 30 49	3041
	Mars	W.	16 59 14	2883	18 31 54	2901	20 4 12	2917	21 36 9	2935
	Regulus	E.	56 53 2	2676	55 15 50	2692	53 39 0	2709	52 2 32	2726
	Saturn	E.	68 49 25	2661	67 11 53	2677	65 34 42	2693	63 57 53	2709
	Spica	E.	110 56 31	2678	109 19 21	2693	107 42 32	2709	106 6 4	2724
12	Sun	W.	52 54 15	3123	54 21 57	3139	55 49 19	3154	57 16 23	3169
	Mars	W.	29 10 44	3014	30 40 39	3030	32 10 15	3045	33 39 32	3060
	Regulus	E.	44 5 48	2810	42 31 33	2826	40 57 39	2843	39 24 7	2860
	Saturn	E.	55 59 3	2788	54 24 19	2802	52 49 54	2818	51 15 49	2832
	Spica	E.	98 8 44	2799	96 34 15	2814	95 0 5	2828	93 26 13	2842
13	Sun	W.	64 27 17	3242	65 52 37	3254	67 17 42	3267	68 42 32	3280
	Regulus	E.	31 41 51	2945	30 10 29	2963	28 39 30	2982	27 8 55	3001
	Saturn	E.	43 30 4	2902	41 57 48	2916	40 25 50	2929	38 54 8	2942
	Spica	E.	85 41 22	2909	84 9 14	2922	82 37 23	2934	81 5 47	2946

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Spica	W.	114° 12′ 44″	2328	115° 58′ 2″	2322	117° 43′ 30″	2314	119° 29′ 9″	2306
	Antares	W.	68 19 58	2317	70 5 32	2309	71 51 19	2301	73 37 17	2292
	α Pegasi	E.	42 16 40	3370	40 53 49	3444	39 32 19	3524	38 12 21	3620
	Venus	E.	48 33 51	2693	46 57 2	2684	45 20 1	2676	43 42 49	2669
	Sun	E.	84 27 59	2615	82 49 24	2605	81 10 36	2596	79 31 36	2586
2	Antares	W.	82 30 6	2255	84 17 12	2247	86 4 29	2241	87 51 56	2235
	Venus	E.	35 34 16	2632	33 56 5	2626	32 17 45	2620	30 39 17	2615
	Sun	E.	71 13 48	2548	69 33 42	2541	67 53 26	2534	66 13 0	2527
3	Antares	W.	96 51 24	2206	98 39 42	2202	100 28 6	2198	102 16 37	2194
	α Aquilæ	W.	55 29 9	3462	56 50 16	3406	58 12 26	3354	59 35 35	3306
	Venus	E.	22 25 28	2599	20 46 32	2600	19 7 37	2603	17 28 46	2607
	Sun	E.	57 48 34	2497	56 7 16	2492	54 25 52	2487	52 44 21	2484
4	Antares	W.	111 20 27	2181	113 9 23	2179	114 58 22	2178	116 47 22	2178
	α Aquilæ	W.	66 43 36	3126	68 11 12	3102	69 39 19	3079	71 7 54	3058
	Sun	E.	44 15 29	2468	42 33 31	2467	40 51 31	2466	39 9 30	2465
5	α Aquilæ	W.	78 36 13	2990	80 6 38	2984	81 37 11	2978	83 7 51	2976
	Fomalhaut	W.	44 34 41	2512	46 15 37	2494	47 56 58	2479	49 38 41	2466
	Sun	E.	30 39 25	2470	28 57 30	2474	27 15 40	2477	25 33 55	2481
6	α Aquilæ	W.	90 41 20	2988	92 11 48	2997	93 42 5	3006	95 12 10	3018
	Fomalhaut	W.	58 10 55	2430	59 53 47	2427	61 36 43	2426	63 19 40	2427
	α Pegasi	W.	43 1 59	3158	44 28 59	3103	45 57 5	3056	47 26 8	3015
	Sun	E.	17 7 5	2520	15 26 19	2531	13 45 49	2545	12 5 38	2561
9	Sun	W.	22 28 10	2794	24 2 46	2808	25 37 3	2825	27 10 59	2841
	Pollux	E.	40 34 17	2477	38 52 32	2494	37 11 10	2510	35 30 11	2527
	Regulus	E.	76 48 49	2480	75 7 8	2496	73 25 49	2512	71 44 52	2527
10	Sun	W.	34 55 26	2923	36 27 16	2939	37 58 45	2957	39 29 52	2973
	Pollux	E.	27 11 17	2618	25 32 46	2638	23 54 42	2657	22 17 5	2678
	Regulus	E.	63 25 38	2609	61 46 55	2626	60 8 35	2642	58 30 37	2659
11	Sun	W.	47 0 11	3058	48 29 12	3074	49 57 53	3091	51 26 14	3107
	Mars	W.	23 7 44	2950	24 38 59	2966	26 9 54	2982	27 40 29	2998
	Regulus	E.	50 23 27	2743	48 50 44	2760	47 15 23	2777	45 40 25	2793
	Saturn	E.	62 21 25	2725	60 45 18	2741	59 9 32	2756	57 34 7	2772
	Spica	E.	104 29 56	2739	102 54 8	2754	01 18 40	2769	99 43 32	2785
12	Sun	W.	58 43 9	3184	60 9 37	3199	61 35 47	3214	63 1 40	3227
	Mars	W.	35 8 31	3074	36 37 12	3089	38 5 35	3103	39 33 41	3118
	Regulus	E.	37 50 57	2876	36 18 8	2894	34 45 41	2910	33 13 35	2927
	Saturn	E.	49 42 3	2847	48 8 36	2861	46 35 27	2876	45 2 37	2889
	Spica	E.	91 52 40	2856	90 19 25	2869	88 46 27	2883	87 13 46	2896
13	Sun	W.	70 7 7	3292	71 31 28	3304	72 55 35	3315	74 19 29	3325
	Regulus	E.	25 38 44	3022	24 8 59	3044	22 39 41	3067	21 10 51	3091
	Saturn	E.	37 22 43	2954	35 51 33	2967	34 20 39	2979	32 50 0	2992
	Spica	E.	79 34 26	2956	78 3 20	2968	76 32 27	2979	75 1 48	2989

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	SUN	W.	75 43 11	3336	77 6 41	3346	78 29 59	3356	79 53 6	3365
	Pollux	W.	17 21 45	3032	18 51 18	3034	20 20 49	3037	21 50 16	3039
	SATURN	E.	31 19 37	3003	29 49 28	3015	28 19 34	3027	26 49 55	3039
	Spica	E.	73 31 21	2999	72 1 7	3009	70 31 6	3018	69 1 16	3026
	Antares	E.	119 25 5	2992	117 54 42	3001	116 24 30	3009	114 54 29	3017
15	SUN	W.	86 46 17	3402	88 8 31	3408	89 30 38	3414	90 52 39	3419
	Pollux	W.	29 16 29	3059	30 45 29	3063	32 14 24	3066	33 43 15	3070
	Spica	E.	61 34 37	3065	60 5 45	3071	58 37 0	3078	57 8 23	3083
	Antares	E.	107 26 39	3051	105 57 29	3056	104 28 25	3060	102 59 27	3065
16	SUN	W.	97 41 31	3435	99 3 8	3438	100 24 42	3439	101 46 14	3439
	Pollux	W.	41 6 37	3080	42 35 11	3082	44 3 43	3082	45 32 15	3082
	Spica	E.	49 46 51	3105	48 18 48	3109	46 50 49	3112	45 22 54	3114
	Antares	E.	95 35 50	3081	94 7 17	3082	92 38 46	3083	91 10 16	3084
17	SUN	W.	108 33 56	3436	109 55 32	3433	111 17 11	3431	112 38 53	3428
	Pollux	W.	52 54 58	3077	54 23 36	3075	55 52 16	3072	57 21 0	3069
	Regulus	W.	17 14 15	3232	18 39 46	3208	20 5 46	3187	21 32 11	3168
	Spica	E.	38 4 6	3127	36 36 29	3129	35 8 54	3130	33 41 21	3133
	Antares	E.	83 47 48	3081	82 19 15	3079	80 50 40	3077	79 22 2	3073
18	SUN	W.	119 28 27	3403	120 50 40	3399	122 12 58	3393	123 35 23	3386
	Pollux	W.	64 45 50	3047	66 15 5	3041	67 44 27	3034	69 13 57	3029
	Regulus	W.	28 48 58	3102	30 17 5	3092	31 45 24	3082	33 13 56	3072
	SATURN	W.	16 41 10	3119	18 8 56	3104	19 37 1	3089	21 5 24	3075
	Antares	E.	71 57 49	3054	70 28 43	3048	68 59 30	3043	67 30 10	3037
19	Pollux	W.	76 43 29	2992	78 13 52	2984	79 44 25	2975	81 15 9	2967
	Regulus	W.	40 39 42	3021	42 9 29	3011	43 39 28	3001	45 9 40	2990
	SATURN	W.	28 31 6	3019	30 0 55	3009	31 30 57	2998	33 1 12	2987
	Antares	E.	60 1 35	3003	58 31 26	2995	57 1 7	2988	55 30 39	2979
	α Aquilæ	E.	106 14 56	3855	105 0 50	3835	103 46 24	3816	102 31 38	3796
20	Pollux	W.	88 51 38	2919	90 23 33	2909	91 55 40	2898	93 28 1	2888
	Regulus	W.	52 43 56	2937	54 15 28	2926	55 47 14	2915	57 19 14	2904
	SATURN	W.	40 35 49	2934	42 7 25	2923	43 39 15	2912	45 11 19	2901
	Antares	E.	47 55 39	2936	46 24 6	2927	44 52 22	2918	43 20 26	2909
	α Aquilæ	E.	96 13 10	3715	94 56 39	3701	93 39 53	3689	92 22 54	3676
21	Pollux	W.	101 13 11	2833	102 46 56	2822	104 20 55	2811	105 55 9	2799
	Regulus	W.	65 2 53	2846	66 36 21	2834	68 10 5	2822	69 44 4	2811
	SATURN	W.	52 55 15	2843	54 28 47	2832	56 2 32	2821	57 36 34	2808
	Antares	E.	35 37 55	2865	34 4 51	2857	32 31 37	2849	30 58 13	2842
	α Aquilæ	E.	85 54 56	3626	84 36 50	3620	83 18 37	3613	82 0 17	3609
	Fomalhaut	E.	117 57 48	3043	116 28 29	3026	114 58 48	3009	113 28 47	2993
22	Regulus	W.	77 37 49	2752	79 13 20	2740	80 49 7	2729	82 25 9	2716
	SATURN	W.	65 30 32	2750	67 6 6	2738	68 41 55	2726	70 18 0	2715
	Spica	W.	23 55 38	2859	25 28 50	2835	27 2 33	2811	28 36 46	2791
	α Aquilæ	E.	75 27 40	3600	74 9 6	3602	72 50 34	3606	71 32 6	3612
	Fomalhaut	E.	105 53 44	2917	104 21 47	2903	102 49 32	2890	101 17 0	2876

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Sun	W.	81° 16′ 2″	3373	82° 38′ 49″	3381	84° 1′ 27″	3389	85° 23′ 56″	3396
	Pollux	W.	23 19 40	3043	24 48 59	3047	26 18 14	3051	27 47 24	3055
	Saturn	E.	25 20 30	3051	23 51 20	3063	22 22 25	3076	20 53 46	3091
	Spica	E.	67 31 36	3035	66 2 7	3043	64 32 48	3051	63 3 38	3058
	Antares	E.	113 24 37	3025	111 54 55	3031	110 25 21	3039	108 55 56	3045
15	Sun	W.	92 14 34	3423	93 36 24	3427	94 58 10	3431	96 19 52	3433
	Pollux	W.	35 12 1	3073	36 40 44	3075	38 9 24	3077	39 38 2	3079
	Spica	E.	55 39 53	3088	54 11 29	3093	52 43 11	3097	51 14 58	3102
	Antares	E.	101 30 35	3069	100 1 48	3073	98 33 5	3076	97 4 26	3078
16	Sun	W.	103 7 46	3440	104 29 17	3439	105 50 49	3438	107 12 22	3436
	Pollux	W.	47 0 46	3082	48 29 17	3082	49 57 49	3081	51 26 22	3078
	Spica	E.	43 55 2	3117	42 27 13	3120	40 59 28	3123	39 31 46	3124
	Antares	E.	89 41 47	3064	88 13 18	3064	86 44 49	3063	85 16 19	3062
17	Sun	W.	114 0 38	3423	115 22 28	3420	116 44 22	3415	118 6 21	3409
	Pollux	W.	58 49 48	3065	60 18 40	3060	61 47 38	3056	63 16 41	3052
	Regulus	W.	22 58 58	3153	24 26 4	3138	25 53 27	3126	27 21 5	3114
	Spica	E.	32 13 52	3136	30 46 26	3139	29 19 4	3143	27 51 47	3148
	Antares	E.	77 53 20	3070	76 24 34	3067	74 55 44	3063	73 26 49	3059
18	Sun	W.	124 57 56	3379	126 20 37	3371	127 43 27	3363	129 6 26	3354
	Pollux	W.	70 43 34	3022	72 13 19	3015	73 43 13	3008	75 13 16	3000
	Regulus	W.	34 42 40	3061	36 11 37	3052	37 40 46	3041	39 10 8	3031
	Saturn	W.	22 34 4	3063	24 2 59	3052	25 32 8	3041	27 1 30	3030
	Antares	E.	66 0 43	3030	64 31 8	3025	63 1 26	3018	61 31 35	3010
19	Pollux	W.	82 46 3	2958	84 17 9	2948	85 48 27	2939	87 19 56	2929
	Regulus	W.	46 40 5	2980	48 10 43	2969	49 41 34	2959	51 12 38	2948
	Saturn	W.	34 31 41	2977	36 2 23	2966	37 33 18	2955	39 4 27	2945
	Antares	E.	54 0 0	2971	52 29 11	2962	50 58 11	2954	49 27 1	2945
	α Aquilæ	E.	101 16 32	3778	100 1 7	3762	98 45 25	3746	97 29 26	3729
20	Pollux	W.	95 0 35	2877	96 33 23	2866	98 6 25	2855	99 39 41	2845
	Regulus	W.	58 51 28	2892	60 23 57	2880	61 56 41	2869	63 29 40	2858
	Saturn	W.	46 43 37	2889	48 16 10	2878	49 48 57	2866	51 21 59	2855
	Antares	E.	41 48 19	2900	40 16 0	2891	38 43 30	2882	37 10 48	2873
	α Aquilæ	E.	91 5 41	3664	89 48 16	3654	88 30 40	3644	87 12 53	3635
21	Pollux	W.	107 29 38	2788	109 4 22	2777	110 39 20	2766	112 14 33	2753
	Regulus	W.	71 18 18	2798	72 52 48	2787	74 27 33	2775	76 2 33	2763
	Saturn	W.	59 10 51	2797	60 45 23	2785	62 20 11	2773	63 55 14	2762
	Antares	E.	29 24 39	2835	27 50 57	2829	26 17 7	2825	24 43 12	2822
	α Aquilæ	E.	80 41 52	3605	79 23 23	3601	78 4 50	3599	76 46 15	3599
	Fomalhaut	E.	111 58 25	2977	110 27 44	2962	108 56 43	2946	107 25 23	2931
22	Regulus	W.	84 1 27	2705	85 38 0	2693	87 14 49	2683	88 51 52	2671
	Saturn	W.	71 54 20	2703	73 30 56	2692	75 7 47	2681	76 44 53	2669
	Spica	W.	30 11 26	2771	31 46 32	2758	33 22 3	2735	34 57 57	2719
	α Aquilæ	E.	70 13 45	3619	68 55 31	3629	67 37 28	3640	66 19 37	3653
	Fomalhaut	E.	99 44 10	2898	98 11 3	2850	96 37 40	2838	95 4 1	2806

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
23	Regulus	W.	90° 29′ 11″	2660	92° 6′ 45″	2649	93° 44′ 33″	2638	95° 22′ 36″	2627
	Saturn	W.	78 22 14	2658	79 59 50	2647	81 37 41	2636	83 15 47	2626
	Spica	W.	36 34 12	2703	38 10 48	2687	39 47 45	2673	41 25 1	2659
	α Aquilæ	E.	65 2 0	3669	63 44 40	3688	62 27 40	3709	61 11 3	3733
	Fomalhaut	E.	93 30 6	2814	91 55 56	2802	90 21 31	2791	88 46 51	2781
24	Regulus	W.	103 36 27	2577	105 15 54	2566	106 55 35	2557	108 35 29	2548
	Spica	W.	49 35 53	2596	51 14 54	2584	52 54 11	2573	54 33 43	2562
	α Aquilæ	E.	54 55 33	3913	53 42 26	3963	52 30 10	4019	51 18 49	4081
	Fomalhaut	E.	80 50 16	2734	79 14 21	2726	77 38 16	2719	76 2 1	2711
	α Pegasi	E.	99 40 28	2980	98 9 50	2966	96 38 55	2954	95 7 44	2942
25	Spica	W.	62 55 1	2512	64 35 58	2503	66 17 7	2494	67 58 28	2485
	Antares	W.	17 13 40	2616	18 52 13	2586	20 31 27	2561	22 11 15	2541
	Fomalhaut	E.	67 58 40	2686	66 21 41	2682	64 44 37	2680	63 7 30	2678
	α Pegasi	E.	87 28 27	2895	85 56 2	2889	84 23 29	2883	82 50 49	2878
26	Spica	W.	76 28 11	2446	78 10 40	2438	79 53 20	2432	81 36 9	2425
	Antares	W.	30 36 18	2469	32 18 15	2458	34 0 28	2448	35 42 55	2438
	Fomalhaut	E.	55 1 46	2685	53 24 46	2690	51 47 53	2697	50 11 9	2705
	α Pegasi	E.	75 6 16	2868	73 33 16	2869	72 0 18	2871	70 27 22	2875
27	Spica	W.	90 12 31	2396	91 56 12	2390	93 40 1	2385	95 23 57	2381
	Antares	W.	44 18 16	2398	46 1 53	2392	47 45 39	2385	49 29 35	2380
	Fomalhaut	E.	42 11 9	2781	40 36 16	2805	39 1 55	2834	37 28 11	2868
	α Pegasi	E.	62 44 26	2914	61 12 25	2927	59 40 41	2942	58 9 16	2959
	α Arietis	E.	103 54 49	2485	102 13 14	2478	100 31 30	2472	98 49 37	2465
	Sun	E.	133 4 39	2684	131 27 37	2678	129 50 28	2672	128 13 11	2668
28	Spica	W.	104 5 14	2359	105 49 47	2355	107 34 26	2352	109 19 10	2349
	Antares	W.	58 11 15	2353	59 55 57	2348	61 40 46	2344	63 25 41	2339
	α Pegasi	E.	50 38 42	3089	49 10 19	3127	47 42 42	3168	46 15 55	3216
	α Arietis	E.	90 18 14	2441	88 35 37	2437	86 52 55	2433	85 10 8	2431
	Venus	E.	90 13 59	2724	88 37 51	2720	87 1 38	2716	85 25 19	2712
	Sun	E.	120 5 4	2643	118 27 7	2639	116 49 5	2635	115 10 57	2631
29	Antares	W.	72 11 43	2322	73 57 10	2319	75 42 42	2316	77 28 18	2313
	α Arietis	E.	76 35 16	2420	74 52 10	2419	73 9 2	2418	71 25 53	2418
	Venus	E.	77 22 29	2694	75 45 41	2691	74 8 49	2687	72 31 52	2685
	Sun	E.	106 59 1	2613	105 20 24	2610	103 41 42	2607	102 2 56	2604
30	Antares	W.	86 17 18	2301	88 3 16	2300	89 49 16	2298	91 35 19	2296
	α Aquilæ	W.	48 0 44	3992	49 12 31	3899	50 25 52	3816	51 40 38	3739
	α Arietis	E.	62 50 18	2424	61 7 17	2427	59 24 21	2430	57 41 29	2434
	Venus	E.	64 26 17	2672	62 49 0	2671	61 11 41	2669	59 34 19	2667
	Sun	E.	93 48 14	2592	92 9 8	2590	90 29 59	2588	88 50 48	2587
31	Antares	W.	100 26 3	2291	102 12 16	2290	103 58 30	2290	105 44 44	2289
	α Aquilæ	W.	58 12 24	3451	59 33 43	3408	60 55 51	3368	62 18 44	3333
	α Arietis	E.	49 9 4	2469	47 27 7	2480	45 45 25	2491	44 3 59	2505
	Venus	E.	51 27 0	2661	49 49 28	2660	48 11 54	2659	46 34 19	2659
	Sun	E.	80 34 22	2580	78 55 0	2580	77 15 37	2579	75 36 13	2578

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
23	Regulus	W.	97 0 54	2617	98 39 26	2606	100 18 13	2596	101 57 13	2586
	Saturn	W.	84 54 7	2615	86 32 42	2604	88 11 31	2593	89 50 35	2583
	Spica	W.	43 2 36	2646	44 40 29	2638	46 18 40	2630	47 57 8	2627
	α Aquilæ	E.	59 54 51	3762	58 39 9	3792	57 23 59	3828	56 9 26	3867
	Fomalhaut	E.	87 11 58	2770	85 36 51	2761	84 1 32	2751	82 26 0	2742
24	Regulus	W.	110 15 36	2539	111 55 55	2530	113 36 27	2522	115 17 10	2513
	Spica	W.	56 13 30	2551	57 53 32	2541	59 33 48	2531	61 14 18	2522
	α Aquilæ	E.	50 8 29	4152	48 59 17	4230	47 51 19	4318	46 44 43	4415
	Fomalhaut	E.	74 25 36	2705	72 49 3	2699	71 12 22	2694	69 35 34	2689
	α Pegasi	E.	93 36 18	2931	92 4 38	2921	90 32 46	2912	89 0 42	2903
25	Spica	W.	69 40 2	2477	71 21 47	2469	73 3 44	2461	74 45 52	2453
	Antares	W.	23 51 31	2523	25 32 12	2507	27 13 15	2494	28 54 37	2480
	Fomalhaut	E.	61 30 20	2677	59 53 9	2678	58 15 59	2679	56 38 51	2681
	α Pegasi	E.	81 18 2	2874	79 45 10	2871	78 12 14	2869	76 39 16	2868
26	Spica	W.	83 19 8	2419	85 2 16	2412	86 45 33	2407	88 28 58	2401
	Antares	W.	37 25 36	2429	39 8 29	2421	40 51 34	2413	42 34 50	2406
	Fomalhaut	E.	48 34 36	2715	46 58 16	2728	45 22 13	2743	43 46 30	2760
	α Pegasi	E.	68 54 31	2880	67 21 46	2886	65 49 8	2894	64 16 41	2903
27	Spica	W.	97 7 59	2376	98 52 8	2371	100 36 24	2367	102 20 46	2363
	Antares	W.	51 13 39	2373	52 57 52	2368	54 42 12	2363	56 26 40	2358
	Fomalhaut	E.	35 55 11	2906	34 23 2	2954	32 51 52	3011	31 21 53	3078
	α Pegasi	E.	56 38 12	2979	55 7 33	3002	53 37 23	3028	52 7 45	3056
	α Arietis	E.	97 7 35	2460	95 25 26	2455	93 43 9	2450	92 0 45	2445
	Sun	E.	126 35 48	2662	124 58 17	2657	123 20 39	2652	121 42 55	2647
28	Spica	W.	111 3 58	2346	112 48 50	2343	114 33 47	2341	116 18 47	2338
	Antares	W.	65 10 43	2336	66 55 50	2332	68 41 3	2328	70 26 21	2326
	α Pegasi	E.	44 50 5	3270	43 25 18	3330	42 1 41	3399	40 39 23	3477
	α Arietis	E.	83 27 17	2428	81 44 22	2425	80 1 23	2423	78 18 21	2421
	Venus	E.	83 48 55	2708	82 12 26	2704	80 35 52	2701	78 59 13	2697
	Sun	E.	113 32 44	2626	111 54 25	2624	110 16 2	2620	108 37 34	2616
29	Antares	W.	79 13 59	2310	80 59 44	2308	82 45 32	2306	84 31 23	2303
	α Arietis	E.	69 42 44	2419	67 59 36	2419	66 16 28	2420	64 33 22	2422
	Venus	E.	70 54 52	2682	69 17 48	2680	67 40 41	2678	66 3 31	2675
	Sun	E.	100 24 7	2601	98 45 14	2599	97 6 17	2596	95 27 17	2594
30	Antares	W.	93 21 24	2295	95 7 31	2294	96 53 40	2292	98 39 51	2291
	α Aquilæ	W.	52 56 44	3671	54 14 2	3606	55 32 28	3550	56 51 57	3497
	α Arietis	E.	55 58 43	2439	54 16 4	2445	52 33 34	2452	50 51 13	2460
	Venus	E.	57 56 55	2666	56 19 29	2664	54 42 1	2663	53 4 31	2662
	Sun	E.	87 11 35	2585	85 32 19	2584	83 53 2	2583	82 13 43	2581
31	Antares	W.	107 30 59	2289	109 17 14	2290	111 3 28	2290	112 49 42	2291
	α Aquilæ	W.	63 42 17	3300	65 6 28	3271	66 31 13	3244	67 56 30	3220
	α Arietis	E.	42 22 53	2521	40 42 9	2539	39 1 50	2561	37 22 1	2565
	Venus	E.	44 56 44	2659	43 19 9	2658	41 41 33	2658	40 3 57	2659
	Sun	E.	73 56 48	2578	72 17 23	2578	70 37 58	2578	68 58 33	2579

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	4 36 16.68	10.231	N.22 3 34.2	+20.43	15 48.35	68.41	2 26.67	0.373
Tues.	2	4 40 22.45	10.248	22 11 33.1	19.47	15 48.21	68.47	2 17.48	0.390
Wed.	3	4 44 28.63	10.265	22 19 8.8	18.50	15 48.07	68.52	2 7.89	0.407
Thur.	4	4 48 35.18	10.280	22 26 21.2	+17.52	15 47.94	68.57	1 57.93	0.422
Frid.	5	4 52 42 10	10.294	22 33 10.1	16.54	15 47.82	68.62	1 47.60	0.436
Sat.	6	4 56 49.35	10.308	22 39 35.4	15.55	15 47.70	68.66	1 36.93	0.450
SUN.	7	5 0 56.92	10.321	22 45 36.8	+14.56	15 47.58	68.70	1 25 95	0.462
Mon.	8	5 5 4.78	10.332	22 51 14.3	13.56	15 47.47	68.74	1 14.68	0.474
Tues.	9	5 9 12.92	10.343	22 56 27.6	12.55	15 47.37	68.78	1 3.14	0.485
Wed.	10	5 13 21.29	10.353	23 1 16.7	+11.54	15 47.27	68.82	0 51.36	0.495
Thur.	11	5 17 29.88	10.362	23 5 41.5	10.52	15 47.17	68.85	0 39.36	0.504
Frid.	12	5 21 38.66	10.369	23 9 41.8	9.50	15 47.08	68.88	0 27.17	0.511
Sat.	13	5 25 47.62	10.375	23 13 17.6	+ 8.48	15 47.00	68.90	0 14.80	0.518
SUN.	14	5 29 56.72	10.381	23 16 28.8	7.45	15 46.92	68.92	0 2.30	0.523
Mon.	15	5 34 5.93	10.386	23 19 15.3	6.42	15 46.85	68.94	0 10.32	0.528
Tues.	16	5 38 15.24	10.389	23 21 37.1	+ 5.39	15 46.78	68.96	0 23.05	0.532
Wed.	17	5 42 24.64	10.392	23 23 34.2	4.36	15 46.71	68.97	0 35.86	0.534
Thur.	18	5 46 34.09	10.394	23 25 6.5	3.33	15 46.64	68.98	0 48.72	0.536
Frid.	19	5 50 43.59	10.395	23 26 14.1	+ 2.29	15 46.58	68.98	1 1.62	0.537
Sat.	20	5 54 53.10	10.395	23 26 56.9	1.26	15 46.52	68.98	1 14.53	0.537
SUN.	21	5 59 2.60	10.395	23 27 14.9	+ 0.23	15 46.47	68.98	1 27.43	0 537
Mon.	22	6 3 12.07	10.394	23 27 8.1	− 0.80	15 46.42	68.98	1 40.31	0.536
Tues.	23	6 7 21.51	10.391	23 26 36.5	1.83	15 46.37	68.97	1 53.16	0.534
Wed.	24	6 11 30.89	10.388	23 25 40.1	2.86	15 46 33	68.96	2 5.95	0.532
Thur.	25	6 15 40.19	10.384	23 24 19.1	− 3.89	15 46.30	68.94	2 18.65	0.528
Frid.	26	6 19 49.38	10.380	23 22 33.5	4.92	15 46.26	68.92	2 31.24	0.523
Sat.	27	6 23 58.44	10.375	23 20 23.2	5.94	15 46.22	68.90	2 43.71	0.518
SUN.	28	6 28 7.36	10.368	23 17 48.4	− 6.96	15 46.19	68.88	2 56.04	0.511
Mon.	29	6 32 16.12	10.361	23 14 49.0	7.98	15 46.16	68.85	3 8.22	0.504
Tues.	30	6 36 24.69	10.352	23 11 25.1	9.00	15 46.14	68.82	3 20.20	0.495
Wed.	31	6 40 33.06	10.343	N.23 7 36.8	−10.01	15 46.12	68.79	3 31.97	0.485

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	4 36 17.10	10.230	N. 22 3 35.0	+20.43	2 26.66	0.373	4 38 43.76
Tues.	2	4 40 22.85	10.247	22 11 33.8	19.47	2 17.47	0.390	4 42 40.32
Wed.	3	4 44 29.00	10.264	22 19 9.4	18.50	2 7.88	0.407	4 46 36.88
Thur.	4	4 48 35.52	10.279	22 26 21.8	+17.52	1 57.92	0.422	4 50 33.44
Frid.	5	4 52 42.40	10.294	22 33 10.6	16.54	1 47.59	0.436	4 54 29.99
Sat.	6	4 56 49.63	10.307	22 39 35.8	15.55	1 36.92	0.450	4 58 26.55
SUN.	7	5 0 57.17	10.320	22 45 37.1	+14.56	1 25.94	0.462	5 2 23.11
Mon.	8	5 5 5.00	10.331	22 51 14.5	13.56	1 14.67	0.474	5 6 19.67
Tues.	9	5 9 13.10	10.342	22 56 27.8	12.55	1 3.13	0.485	5 10 16.23
Wed.	10	5 13 21.43	10.352	23 1 16.8	+11.54	0 51 35	0.495	5 14 12.78
Thur.	11	5 17 29.99	10.361	23 5 41.5	10.52	0 39.35	0.504	5 18 9.34
Frid.	12	5 21 38.74	10.368	23 9 41.8	9.50	0 27.16	0.511	5 22 5.90
Sat.	13	5 25 47.66	10.375	23 13 17.6	+ 8.48	0 14.80	0.518	5 26 2.46
SUN.	14	5 29 56.72	10.380	23 16 28.8	7.45	0 2.30	0.523	5 29 59.02
Mon.	15	5 34 5.90	10.385	23 19 15.3	6.42	0 10.32	0.528	5 33 55.58
Tues.	16	5 38 15.18	10.388	23 21 37.1	+ 5.39	0 23.04	0.532	5 37 52.14
Wed.	17	5 42 24.54	10.391	23 23 34.2	4.36	0 35.85	0.534	5 41 48.69
Thur.	18	5 46 33.96	10.393	23 25 6.5	3.33	0 48.71	0.536	5 45 45.25
Frid.	19	5 50 43.42	10.394	23 26 14.1	+ 2.29	1 1.61	0.537	5 49 41.81
Sat.	20	5 54 52.89	10.394	23 26 56.9	1.26	1 14.52	0.537	5 53 38.37
SUN.	21	5 59 2.35	10.394	23 27 14.9	+ 0.23	1 27.42	0.537	5 57 34.93
Mon.	22	6 3 11.79	10.393	23 27 8.1	− 0.80	1 40.30	0.536	6 1 31.49
Tues.	23	6 7 21.19	10.391	23 26 36.6	1.83	1 53.15	0.534	6 5 28.04
Wed.	24	6 11 30.53	10.388	23 25 40.3	2.86	2 5.93	0.532	6 9 24.60
Thur.	25	6 15 39.79	10.384	23 24 19.3	− 3.89	2 18.63	0.528	6 13 21.16
Frid.	26	6 19 48.94	10.379	23 22 33.7	4.92	2 31.22	0.523	6 17 17.72
Sat.	27	6 23 57.97	10.374	23 20 23.5	5.94	2 43.69	0.518	6 21 14.28
SUN.	28	6 28 6.86	10.367	23 17 48.7	− 6.96	2 56.02	0.511	6 25 10.84
Mon.	29	6 32 15.59	10.360	23 14 49.4	7.98	3 8.19	0.504	6 29 7.40
Tues.	30	6 36 24.12	10.351	23 11 25.6	9.00	3 20.17	0.495	6 33 3.95
Wed.	31	6 40 32.45	10.342	N. 23 7 37.4	−10.01	3 31.94	0.485	6 37 0.51

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 hour,
$+9^{s}.8565$
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	152	70 40 21.7	40 17.2	143.68	− 0.35	0.0062091	+27.2	19 18 6.01
2	153	71 37 49.8	37 45.1	143.65	0.27	0.0062734	26.3	19 14 10.10
3	154	72 35 17.2	35 12.3	143.62	0.17	0.0063355	25.4	19 10 14.18
4	155	73 32 43.8	32 38.7	143.59	− 0.05	0.0063954	+24.5	19 6 18.26
5	156	74 30 9.6	30 4.4	143.56	+ 0.08	0.0064530	23.5	19 2 22.35
6	157	75 27 34.6	27 29.2	143.53	0.21	0.0065081	22.5	18 58 26.44
7	158	76 24 58.8	24 53.2	143.49	+ 0.34	0.0065607	+21.4	18 54 30.53
8	159	77 22 22.1	22 16.3	143.46	0.46	0.0066109	20.4	18 50 34.61
9	160	78 19 44.5	19 38.6	143.42	0.56	0.0066587	19.4	18 46 38.70
10	161	79 17 6.1	17 0.0	143.38	+ 0.64	0.0067040	+18.4	18 42 42.79
11	162	80 14 26.8	14 20 5	143.34	0.70	0.0067469	17.4	18 38 46.87
12	163	81 11 46.5	11 40.0	143.30	0.73	0.0067875	16.5	18 34 50.95
13	164	82 9 5.3	8 58.6	143.26	+ 0.73	0.0068259	+15.6	18 30 55.04
14	165	83 6 23.2	6 16.3	143.22	0.70	0.0068622	14.7	18 26 59.13
15	166	84 3 40.2	3 33.1	143.19	0.65	0.0068966	13.9	18 23 3.22
16	167	85 0 56.4	0 49.1	143.16	+ 0.56	0.0069291	+13.2	18 19 7.30
17	168	85 58 11.8	58 4.3	143.13	0.45	0.0069599	12.5	18 15 11.39
18	169	86 55 26.5	55 18.8	143.10	0.33	0.0069891	11.8	18 11 15.48
19	170	87 52 40.5	52 32.6	143.07	+ 0.20	0.0070168	+11.2	18 7 19.57
20	171	88 49 53.9	49 45.8	143.05	+ 0.07	0.0070430	10.6	18 3 23.65
21	172	89 47 6.8	46 58.5	143.03	− 0.06	0.0070678	10.0	17 59 27.74
22	173	90 44 19.3	44 10.8	143.01	− 0.18	0.0070912	+ 9.4	17 55 31.83
23	174	91 41 31.5	41 22.8	143.00	0.28	0.0071132	8 9	17 51 35.92
24	175	92 38 43.5	38 34.6	143.00	0.36	0.0071337	8.3	17 47 40.00
25	176	93 35 55.3	35 46.3	143.00	− 0.41	0.0071527	+ 7.6	17 43 44.09
26	177	94 33 7.1	32 57.9	143.00	0.43	0.0071701	6.9	17 39 48.18
27	178	95 30 19.0	30 9.6	143 00	0.42	0.0071858	6.2	17 35 52.27
28	179	96 27 30.9	27 21.3	143.00	− 0.37	0.0071997	+ 5.4	17 31 56.35
29	180	97 24 42.9	24 33.2	143.00	0.30	0.0072116	4.5	17 28 0.44
30	181	98 21 55.1	21 45.3	143.01	0.21	0.0072214	3.6	17 24 4.53
31	182	99 19 7.4	18 57.4	143.02	− 0.10	0.0072289	+ 2.6	17 20 8.62

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 11.7	16 11.0	59 19.5	−0.16	59 16.9	−0.29	20 21.2	2.04	24.2
2	16 9.8	16 8.2	59 12.7	0.42	59 6.9	0.56	21 10.3	2.07	25.2
3	16 6.2	16 3.6	58 59.4	0.71	58 50.0	0.86	22 0.6	2.14	26.2
4	16 0.6	15 57.1	58 39.0	−1.00	58 26.2	−1.14	22 53.1	2.23	27.2
5	15 53.2	15 48.9	58 11.8	1.26	57 56.0	1.37	23 47.6	2.30	28.2
6	15 44.3	15 39.4	57 38.9	1.47	57 20.9	1.54	☌		29.2
7	15 34.3	15 29.0	57 2.1	−1.59	56 42.9	−1.60	0 43.6	2.34	0.8
8	15 23.7	15 18.6	56 23.7	1.60	56 4.7	1.56	1 39.7	2.30	1.8
9	15 13.6	15 8.9	55 46.3	1.50	55 28.9	1.40	2 34.1	2.21	2.8
10	15 4.5	15 0.5	55 12.7	−1.29	54 58.1	−1.15	3 25.7	2.08	3.8
11	14 57.0	14 54.0	54 45.2	0.99	54 34.3	0.82	4 13.9	1.94	4.8
12	14 51.7	14 49.9	54 25.7	0.63	54 19.3	0.43	4 59.0	1.82	5.8
13	14 48.9	14 48.5	54 15.5	−0.22	54 14.1	−0.01	5 41.3	1.73	6.8
14	14 48.9	14 49.9	54 15.4	+0.22	54 19.3	+0.43	6 22.1	1.68	7.8
15	14 51.7	14 54.1	54 25.7	0.64	54 34.6	0.85	7 2.2	1.68	8.8
16	14 57.2	15 0.9	54 45.9	+1.04	54 59.5	+1.22	7 42.8	1.72	9.8
17	15 5.1	15 9.9	55 15.1	1.38	55 32.5	1.52	8 24.9	1.81	10.8
18	15 15.0	15 20.5	55 51.4	1.63	56 11.6	1.73	9 9.8	1.95	11.8
19	15 26.2	15 32.1	56 32.7	+1.78	56 54.2	+1.80	9 58.5	2.12	12.8
20	15 38.0	15 43.8	57 15.8	1.79	57 37.1	1.75	10 51.5	2.30	13.8
21	15 49.4	15 54.7	57 57.7	1.67	58 17.1	1.56	11 48.8	2.45	14.8
22	15 59.5	16 3.9	58 35.0	+1.42	58 51.0	+1.26	12 49.2	2.53	15.8
23	16 7.7	16 10.9	59 5.0	1.08	59 16.7	0.88	13 50.4	2.52	16.8
24	16 13.4	16 15.3	59 25.9	0.67	59 32.7	0.47	14 50.0	2.42	17.8
25	16 16.4	16 17.0	59 37.0	+0.27	59 39.0	+0.08	15 46.7	2.29	18.8
26	16 16.9	16 16.3	59 38.8	−0.11	59 36.5	−0.27	16 39.9	2.16	19.8
27	16 15.2	16 13.6	59 32.4	0.41	59 26.7	0.54	17 30.4	2.06	20.8
28	16 11.7	16 9.4	59 19.5	−0.65	59 11.1	−0.75	18 19.0	2.02	21.8
29	16 6.8	16 4.0	59 1.7	0.83	58 51.3	0.90	19 7.3	2.02	22.8
30	16 0.9	15 57.7	58 40.1	0.96	58 28.3	1.01	19 56.2	2.07	23.8
31	15 54.3	15 50.7	58 15.8	−1.07	58 2.7	−1.11	20 46.7	2.15	24.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 19 59.53	2.1325	S. 2 54 51.0	15.527	0	2 2 31.58	2.1670	N. 9 20 56.5	14.581
1	0 22 7.45	2.1316	2 39 19.0	15.541	1	2 4 41.67	2.1693	9 35 29.7	14.526
2	0 24 15.32	2.1307	2 23 46.1	15.554	2	2 6 51.90	2.1717	9 49 59.6	14.470
3	0 26 23.13	2.1298	2 8 12.5	15.565	3	2 9 2.28	2.1742	10 4 26.1	14.412
4	0 28 30.89	2.1290	1 52 38.3	15.574	4	2 11 12.81	2.1767	10 18 49.1	14.353
5	0 30 38.61	2.1283	1 37 3.6	15.582	5	2 13 23.49	2.1792	10 33 8.5	14.293
6	0 32 46.29	2.1277	1 21 28.4	15.589	6	2 15 34.32	2.1818	10 47 24.3	14.232
7	0 34 53.94	2.1271	1 5 52.9	15.594	7	2 17 45.31	2.1845	11 1 36.3	14.168
8	0 37 1.55	2.1266	0 50 17.1	15.598	8	2 19 56.46	2.1872	11 15 44.4	14.103
9	0 39 9.13	2.1262	0 34 41.1	15.601	9	2 22 7.78	2.1900	11 29 48.6	14.037
10	0 41 16.69	2.1258	0 19 5.0	15.602	10	2 24 19.26	2.1928	11 43 48.8	13.969
11	0 43 24.23	2.1256	S. 0 3 28.9	15.602	11	2 26 30.92	2.1957	11 57 44.9	13.901
12	0 45 31.76	2.1254	N. 0 12 7.2	15.600	12	2 28 42.75	2.1986	12 11 36.9	13.831
13	0 47 39.28	2.1253	0 27 43.1	15.597	13	2 30 54.75	2.2015	12 25 24.7	13.759
14	0 49 46.80	2.1253	0 43 18.8	15.592	14	2 33 6.93	2.2045	12 39 8.0	13.684
15	0 51 54.32	2.1254	0 58 54.1	15.585	15	2 35 19.29	2.2075	12 52 46.8	13.609
16	0 54 1.85	2.1256	1 14 29.0	15.577	16	2 37 31.83	2.2106	13 6 21.1	13.534
17	0 56 9.39	2.1258	1 30 3.4	15.569	17	2 39 44.56	2.2137	13 19 50.9	13.457
18	0 58 16.94	2.1260	1 45 37.3	15.559	18	2 41 57.48	2.2168	13 33 16.0	13.378
19	1 0 24.51	2.1264	2 1 10.5	15.547	19	2 44 10.58	2.2199	13 46 36.3	13.298
20	1 2 32.11	2.1268	2 16 42.9	15.533	20	2 46 23.87	2.2232	13 59 51.8	13.217
21	1 4 39.73	2.1272	2 32 14.5	15.519	21	2 48 37.36	2.2264	14 13 2.3	13.133
22	1 6 47.38	2.1278	2 47 45.2	15.502	22	2 50 51.04	2.2297	14 26 7.8	13.049
23	1 8 55.07	2.1286	N. 3 3 14.8	15.484	23	2 53 4.92	2.2329	N. 14 39 8.2	12.963
	TUESDAY 2.					THURSDAY 4.			
0	1 11 2.81	2.1293	N. 3 18 43.3	15.466	0	2 55 18.99	2.2362	N. 14 52 3.4	12.877
1	1 13 10.59	2.1301	3 34 10.7	15.446	1	2 57 33.26	2.2395	15 4 53.4	12.788
2	1 15 18.42	2.1309	3 49 36.8	15.423	2	2 59 47.73	2.2429	15 17 38.0	12.698
3	1 17 26.30	2.1318	4 5 1.5	15.400	3	3 2 2.41	2.2463	15 30 17.2	12.607
4	1 19 34.24	2.1328	4 20 24.8	15.376	4	3 4 17.29	2.2497	15 42 50.9	12.515
5	1 21 42.24	2.1339	4 35 46.6	15.350	5	3 6 32.37	2.2531	15 55 19.0	12.421
6	1 23 50.31	2.1351	4 51 6.8	15.322	6	3 8 47.66	2.2565	16 7 41.4	12.326
7	1 25 58.45	2.1363	5 6 25.3	15.293	7	3 11 3.15	2.2599	16 19 58.1	12.230
8	1 28 6.67	2.1376	5 21 42.0	15.263	8	3 13 18.85	2.2634	16 32 9.0	12.132
9	1 30 14.97	2.1390	5 36 56.8	15.231	9	3 15 34.76	2.2669	16 44 13.9	12.032
10	1 32 23.35	2.1404	5 52 9.7	15.197	10	3 17 50.88	2.2704	16 56 12.8	11.932
11	1 34 31.82	2.1418	6 7 20.5	15.162	11	3 20 7.21	2.2738	17 8 5.7	11.831
12	1 36 40.37	2.1433	6 22 29.2	15.127	12	3 22 23.74	2.2773	17 19 52.5	11.728
13	1 38 49.02	2.1450	6 37 35.7	15.089	13	3 24 40.48	2.2808	17 31 33.0	11.623
14	1 40 57.77	2.1467	6 52 39.9	15.050	14	3 26 57.44	2.2844	17 43 7.2	11.518
15	1 43 6.63	2.1485	7 7 41.7	15.010	15	3 29 14.61	2.2879	17 54 35.1	11.412
16	1 45 15.59	2.1503	7 22 41.1	14.968	16	3 31 31.99	2.2913	18 5 56.6	11.304
17	1 47 24.66	2.1522	7 37 37.9	14.924	17	3 33 49.57	2.2947	18 17 11.6	11.195
18	1 49 33.85	2.1542	7 52 32.0	14.879	18	3 36 7.36	2.2982	18 28 20.0	11.084
19	1 51 43.16	2.1562	8 7 23.4	14.833	19	3 38 25.36	2.3017	18 39 21.7	10.972
20	1 53 52.59	2.1582	8 22 12.0	14.786	20	3 40 43.57	2.3052	18 50 16.7	10.859
21	1 56 2.14	2.1602	8 36 57.7	14.737	21	3 43 1.99	2.3087	19 1 4.8	10.744
22	1 58 11.82	2.1624	8 51 40.4	14.686	22	3 45 20.61	2.3121	19 11 46.0	10.629
23	2 0 21.63	2.1647	9 6 20.0	14.634	23	3 47 39.44	2.3155	19 22 20.3	10.513
24	2 2 31.58	2.1670	N. 9 20 56.5	14.581	24	3 49 58.47	2.3189	N. 19 32 47.6	10.396

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 49 58.47	2.3189	N.19 32 47.6	10.396	0	5 44 21.29	2.4207	N.25 18 12.3	3.722
1	3 52 17.71	2.3223	19 43 7.8	10.277	1	5 46 46.54	2.4208	25 21 51.1	3.571
2	3 54 37.15	2.3257	19 53 20.9	10.157	2	5 49 11.79	2.4208	25 25 20.8	3.419
3	3 56 56.79	2.3290	20 3 26.7	10.036	3	5 51 37.04	2.4207	25 28 41.4	3.267
4	3 59 16.63	2.3323	20 13 25.2	9.914	4	5 54 2.28	2.4206	25 31 52.8	3.114
5	4 1 36.67	2.3356	20 23 16.4	9.791	5	5 56 27.51	2.4202	25 34 55.1	2.962
6	4 3 56.90	2.3388	20 33 0.1	9.666	6	5 58 52.71	2.4198	25 37 48.3	2.810
7	4 6 17.32	2.3420	20 42 36.3	9.541	7	6 1 17.89	2.4194	25 40 32.3	2.658
8	4 8 37.94	2.3452	20 52 5.0	9.415	8	6 3 43.04	2.4188	25 43 7.2	2.506
9	4 10 58.75	2.3484	21 1 26.1	9.287	9	6 6 8.15	2.4181	25 45 33.0	2.353
10	4 13 19.75	2.3515	21 10 39.5	9.159	10	6 8 33.21	2.4172	25 47 49.6	2.201
11	4 15 40.93	2.3545	21 19 45.2	9.030	11	6 10 58.21	2.4162	25 49 57.1	2.049
12	4 18 2.29	2.3575	21 28 43.1	8.900	12	6 13 23.15	2.4152	25 51 55.5	1.897
13	4 20 23.83	2.3605	21 37 33.2	8.768	13	6 15 48.03	2.4141	25 53 44.7	1.745
14	4 22 45.55	2.3634	21 46 15.3	8.635	14	6 18 12.84	2.4129	25 55 24.9	1.594
15	4 25 7.44	2.3662	21 54 49.4	8.502	15	6 20 37.58	2.4116	25 56 56.0	1.443
16	4 27 29.50	2.3691	22 3 15.5	8.368	16	6 23 2.23	2.4101	25 58 18.0	1.292
17	4 29 51.73	2.3719	22 11 33.6	8.234	17	6 25 26.79	2.4085	25 59 31.0	1.141
18	4 32 14.13	2.3746	22 19 43.6	8.098	18	6 27 51.25	2.4068	26 0 34.9	0.990
19	4 34 36.68	2.3772	22 27 45.4	7.961	19	6 30 15.61	2.4051	26 1 29.8	0.840
20	4 36 59.39	2.3798	22 35 38.9	7.823	20	6 32 39.86	2.4032	26 2 15.7	0.689
21	4 39 22.26	2.3824	22 43 24.1	7.684	21	6 35 3.99	2.4012	26 2 52.5	0.539
22	4 41 45.28	2.3848	22 51 1.0	7.546	22	6 37 28.00	2.3992	26 3 20.4	0.390
23	4 44 8.44	2.3872	N.22 58 29.6	7.407	23	6 39 51.89	2.3970	N.26 3 39.3	0.241
	SATURDAY 6.					**MONDAY 8.**			
0	4 46 31.74	2.3895	N.23 5 49.8	7.266	0	6 42 15.64	2.3947	N.26 3 49.3	+ 0.093
1	4 48 55.18	2.3918	23 13 1.5	7.124	1	6 44 39.25	2.3923	26 3 50.4	− 0.056
2	4 51 18.75	2.3940	23 20 4.7	6.981	2	6 47 2.72	2.3898	26 3 42.7	0.202
3	4 53 42.46	2.3960	23 26 59.3	6.838	3	6 49 26.03	2.3872	26 3 26.1	0.350
4	4 56 6.29	2.3980	23 33 45.3	6.695	4	6 51 49.18	2.3845	26 3 0.7	0.497
5	4 58 30.24	2.4001	23 40 22.7	6.552	5	6 54 12.17	2.3818	26 2 26.5	0.643
6	5 0 54.30	2.4019	23 46 51.5	6.408	6	6 56 35.00	2.3790	26 1 43.5	0.789
7	5 3 18.47	2.4038	23 53 11.6	6.262	7	6 58 57.65	2.3760	26 0 51.8	0.934
8	5 5 42.75	2.4056	23 59 22.9	6.115	8	7 1 20.12	2.3729	25 59 51.4	1.078
9	5 8 7.14	2.4073	24 5 25.4	5.968	9	7 3 42.40	2.3698	25 58 42.4	1.222
10	5 10 31.62	2.4087	24 11 19.1	5.822	10	7 6 4.49	2.3666	25 57 24.8	1.365
11	5 12 56.19	2.4103	24 17 4.0	5.674	11	7 8 26.39	2.3633	25 55 58.6	1.508
12	5 15 20.84	2.4115	24 22 40.0	5.526	12	7 10 48.09	2.3599	25 54 23.8	1.651
13	5 17 45.57	2.4128	24 28 7.1	5.377	13	7 13 9.58	2.3564	25 52 40.5	1.792
14	5 20 10.38	2.4141	24 33 25.3	5.229	14	7 15 30.86	2.3528	25 50 48.8	1.932
15	5 22 35.26	2.4152	24 38 34.6	5.080	15	7 17 51.92	2.3492	25 48 48.7	2.072
16	5 25 0.20	2.4162	24 43 34.9	4.931	16	7 20 12.76	2.3454	25 46 40.2	2.211
17	5 27 25.20	2.4170	24 48 26.3	4.781	17	7 22 33.37	2.3416	25 44 23.4	2.350
18	5 29 50.24	2.4178	24 53 8.6	4.630	18	7 24 53.75	2.3377	25 41 58.2	2.488
19	5 32 15.33	2.4186	24 57 41.9	4.479	19	7 27 13.90	2.3337	25 39 24.8	2.625
20	5 34 40.47	2.4192	25 2 6.1	4.328	20	7 29 33.80	2.3297	25 36 43.2	2.761
21	5 37 5.64	2.4197	25 6 21.3	4.177	21	7 31 53.46	2.3256	25 33 53.5	2.896
22	5 39 30.83	2.4201	25 10 27.4	4.026	22	7 34 12.87	2.3214	25 30 55.7	3.031
23	5 41 56.05	2.4205	25 14 24.4	3.874	23	7 36 32.03	2.3172	25 27 49.8	3.165
24	5 44 21.29	2.4207	N.25 18 12.3	3.722	24	7 38 50.93	2.3128	N.25 24 35.9	3.298

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 38 50.93	2.3128	N.25 24 35.9	3.298
1	7 41 9.57	2.3084	25 21 14.0	3.431
2	7 43 27.94	2.3040	25 17 44.2	3.562
3	7 45 46.05	2.2996	25 14 6.6	3.691
4	7 48 3.89	2.2950	25 10 21.3	3.820
5	7 50 21.45	2.2903	25 6 28.2	3.950
6	7 52 38.73	2.2856	25 2 27.3	4.078
7	7 54 55.73	2.2809	24 58 18.8	4.205
8	7 57 12.44	2.2762	24 54 2.7	4.331
9	7 59 28.87	2.2713	24 49 39.1	4.456
10	8 1 45.00	2.2664	24 45 8.0	4.580
11	8 4 0.84	2.2616	24 40 29.5	4.703
12	8 6 16.39	2.2567	24 35 43.6	4.826
13	8 8 31.64	2.2516	24 30 50.4	4.947
14	8 10 46.58	2.2465	24 25 50.0	5.067
15	8 13 1.22	2.2414	24 20 42.4	5.187
16	8 15 15.55	2.2363	24 15 27.6	5.305
17	8 17 29.57	2.2312	24 10 5.8	5.422
18	8 19 43.29	2.2261	24 4 37.0	5.538
19	8 21 56.70	2.2208	23 59 1.2	5.654
20	8 24 9.79	2.2155	23 53 18.5	5.768
21	8 26 22.56	2.2102	23 47 29.0	5.882
22	8 28 35.02	2.2050	23 41 32.7	5.994
23	8 30 47.16	2.1997	N.23 35 29.7	6.105

WEDNESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 32 58.98	2.1943	N.23 29 20.1	6.215
1	8 35 10.48	2.1890	23 23 3.9	6.325
2	8 37 21.66	2.1836	23 16 41.1	6.434
3	8 39 32.52	2.1782	23 10 11.8	6.542
4	8 41 43.05	2.1728	23 3 36.1	6.648
5	8 43 53.26	2.1675	22 56 54.0	6.753
6	8 46 3.15	2.1621	22 50 5.7	6.857
7	8 48 12.71	2.1567	22 43 11.2	6.960
8	8 50 21.95	2.1512	22 36 10.5	7.063
9	8 52 30.86	2.1458	22 29 3.6	7.165
10	8 54 39.45	2.1404	22 21 50.7	7.265
11	8 56 47.71	2.1350	22 14 31.8	7.364
12	8 58 55.65	2.1296	22 7 7.0	7.462
13	9 1 3.26	2.1242	21 59 36.3	7.560
14	9 3 10.55	2.1187	21 51 59.8	7.656
15	9 5 17.51	2.1133	21 44 17.6	7.751
16	9 7 24.15	2.1080	21 36 29.7	7.845
17	9 9 30.47	2.1026	21 28 36.2	7.938
18	9 11 36.46	2.0972	21 20 37.1	8.031
19	9 13 42.13	2.0918	21 12 32.5	8.122
20	9 15 47.48	2.0865	21 4 22.4	8.212
21	9 17 52.51	2.0812	20 56 7.0	8.301
22	9 19 57.22	2.0759	20 47 46.3	8.390
23	9 22 1.62	2.0706	20 39 20.2	8.478
24	9 24 5.70	2.0653	N.20 30 48.9	8.565

THURSDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 24 5.70	2.0653	N.20 30 48.9	8.565
1	9 26 9.46	2.0601	20 22 12.4	8.650
2	9 28 12.91	2.0549	20 13 30.9	8.734
3	9 30 16.05	2.0497	20 4 44.4	8.817
4	9 32 18.87	2.0444	19 55 52.9	8.900
5	9 34 21.38	2.0393	19 46 56.4	8.982
6	9 36 23.59	2.0342	19 37 55.1	9.062
7	9 38 25.49	2.0292	19 28 49.0	9.142
8	9 40 27.09	2.0241	19 19 38.1	9.220
9	9 42 28.38	2.0190	19 10 22.6	9.298
10	9 44 29.37	2.0141	19 1 2.4	9.375
11	9 46 30.07	2.0092	18 51 37.6	9.451
12	9 48 30.47	2.0043	18 42 8.3	9.525
13	9 50 30.58	1.9994	18 32 34.6	9.599
14	9 52 30.40	1.9945	18 22 56.4	9.673
15	9 54 29.92	1.9897	18 13 13.8	9.746
16	9 56 29.16	1.9849	18 3 26.9	9.817
17	9 58 28.11	1.9802	17 53 35.8	9.887
18	10 0 26.78	1.9755	17 43 40.5	9.956
19	10 2 25.17	1.9708	17 33 41.1	10.025
20	10 4 23.28	1.9662	17 23 37.5	10.093
21	10 6 21.12	1.9617	17 13 29.9	10.159
22	10 8 18.69	1.9572	17 3 18.4	10.225
23	10 10 15.99	1.9527	N.16 53 2.9	10.291

FRIDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 12 13.02	1.9482	N.16 42 43.5	10.355
1	10 14 9.78	1.9439	16 32 20.3	10.418
2	10 16 6.29	1.9397	16 21 53.3	10.481
3	10 18 2.54	1.9354	16 11 22.6	10.543
4	10 19 58.54	1.9312	16 0 48.2	10.604
5	10 21 54.29	1.9270	15 50 10.1	10.664
6	10 23 49.78	1.9228	15 39 28.5	10.723
7	10 25 45.03	1.9188	15 28 43.3	10.782
8	10 27 40.04	1.9148	15 17 54.6	10.839
9	10 29 34.81	1.9109	15 7 2.6	10.895
10	10 31 29.35	1.9070	14 56 7.2	10.952
11	10 33 23.65	1.9031	14 45 8.4	11.006
12	10 35 17.72	1.8993	14 34 6.3	11.060
13	10 37 11.57	1.8956	14 23 1.0	11.115
14	10 39 5.20	1.8919	14 11 52.5	11.168
15	10 40 58.60	1.8882	14 0 40.8	11.221
16	10 42 51.79	1.8847	13 49 26.0	11.272
17	10 44 44.77	1.8812	13 38 8.1	11.323
18	10 46 37.54	1.8777	13 26 47.2	11.373
19	10 48 30.10	1.8743	13 15 23.4	11.422
20	10 50 22.46	1.8711	13 3 56.6	11.471
21	10 52 14.63	1.8678	12 52 26.9	11.518
22	10 54 6.60	1.8646	12 40 54.4	11.565
23	10 55 58.38	1.8614	12 29 19.1	11.612
24	10 57 49.97	1.8583	N.12 17 41.0	11.657

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 57 49.97	1.8583	N. 12 17 41.0	11.657
1	10 59 41.38	1.8553	12 6 0.2	11.702
2	11 1 32.61	1.8523	11 54 16.8	11.745
3	11 3 23.66	1.8494	11 42 30.8	11.788
4	11 5 14.54	1.8466	11 30 42.2	11.831
5	11 7 5.26	1.8439	11 18 51.0	11.874
6	11 8 55.81	1.8412	11 6 57.3	11.915
7	11 10 46.20	1.8385	10 55 1.2	11.955
8	11 12 36.43	1.8359	10 43 2.7	11.995
9	11 14 26.51	1.8334	10 31 1.8	12.035
10	11 16 16.44	1.8309	10 18 58.5	12.073
11	11 18 6.22	1.8285	10 6 53.0	12.110
12	11 19 55.86	1.8262	9 54 45.3	12.147
13	11 21 45.37	1.8240	9 42 35.4	12.183
14	11 23 34.74	1.8218	9 30 23.3	12.220
15	11 25 23.98	1.8197	9 18 9.0	12.256
16	11 27 13.10	1.8177	9 5 52.6	12.290
17	11 29 2.10	1.8156	8 53 34.2	12.324
18	11 30 50.97	1.8136	8 41 13.8	12.357
19	11 32 39.73	1.8118	8 28 51.4	12.389
20	11 34 28.39	1.8101	8 16 27.1	12.421
21	11 36 16.94	1.8084	8 4 0.9	12.452
22	11 38 5.39	1.8067	7 51 32.8	12.483
23	11 39 53.74	1.8051	N. 7 39 2.9	12.513

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 41 42.00	1.8036	N. 7 26 31.3	12.542
1	11 43 30.17	1.8022	7 13 57.9	12.571
2	11 45 18.26	1.8007	7 1 22.8	12.598
3	11 47 6.26	1.7994	6 48 46.1	12.626
4	11 48 54.19	1.7982	6 36 7.7	12.653
5	11 50 42.05	1.7970	6 23 27.7	12.679
6	11 52 29.83	1.7958	6 10 46.2	12.704
7	11 54 17.55	1.7948	5 58 3.2	12.729
8	11 56 5.21	1.7939	5 45 18.7	12.754
9	11 57 52.82	1.7931	5 32 32.7	12.777
10	11 59 40.38	1.7922	5 19 45.4	12.800
11	12 1 27.89	1.7914	5 6 56.7	12.822
12	12 3 15.35	1.7908	4 54 6.7	12.844
13	12 5 2.78	1.7902	4 41 15.4	12 865
14	12 6 50.17	1.7896	4 28 22.9	12.886
15	12 8 37.53	1.7891	4 15 29.1	12.906
16	12 10 24.86	1.7887	4 2 34.2	12.923
17	12 12 12.17	1.7884	3 49 38.1	12.944
18	12 13 59.47	1.7882	3 36 40.9	12.962
19	12 15 46.75	1.7879	3 23 42.7	12.979
20	12 17 34.02	1.7878	3 10 43.5	12.996
21	12 19 21.29	1.7877	2 57 43.2	13.012
22	12 21 8.55	1.7877	2 44 42.0	13.027
23	12 22 55.82	1.7879	2 31 39.9	13.042
24	12 24 43.10	1.7881	N. 2 18 36.9	13.057

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 24 43.10	1.7881	N. 2 18 36.9	13.057
1	12 26 30.39	1.7883	2 5 33.1	13.070
2	12 28 17.70	1.7886	1 52 28.5	13.083
3	12 30 5.03	1.7890	1 39 23.1	13.096
4	12 31 52.38	1.7895	1 26 17.0	13.107
5	12 33 39.77	1.7901	1 13 10.2	13.118
6	12 35 27.19	1.7907	1 0 2.8	13.128
7	12 37 14.65	1.7913	0 46 54.8	13.138
8	12 39 2.15	1.7921	0 33 46.2	13.148
9	12 40 49.70	1.7929	0 20 37.0	13.156
10	12 42 37.30	1.7938	N. 0 7 27.4	13.164
11	12 44 24.96	1.7948	S. 0 5 42.7	13.172
12	12 46 12.68	1.7958	0 18 53.2	13.178
13	12 48 0.46	1.7970	0 32 4.1	13.184
14	12 49 48.32	1.7982	0 45 15.3	13.189
15	12 51 36.25	1.7995	0 58 26.8	13.194
16	12 53 24.26	1.8008	1 11 38.6	13.197
17	12 55 12.35	1.8022	1 24 50.5	13.200
18	12 57 0.52	1.8037	1 38 2.6	13.203
19	12 58 48.79	1.8053	1 51 14.9	13.205
20	13 0 37.16	1.8069	2 4 27.2	13.206
21	13 2 25.62	1.8086	2 17 39.6	13.207
22	13 4 14.19	1.8104	2 30 52.0	13.206
23	13 6 2.87	1.8122	S. 2 44 4.3	13.205

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 7 51.66	1.8142	S. 2 57 16.6	13.204
1	13 9 40.57	1.8162	3 10 28.8	13.202
2	13 11 29.60	1.8182	3 23 40.8	13.198
3	13 13 18.76	1.8204	3 36 52.6	13.194
4	13 15 8.05	1.8227	3 50 4.1	13.189
5	13 16 57.48	1.8250	4 3 15.3	13.184
6	13 18 47.05	1.8273	4 16 26.2	13.178
7	13 20 36.76	1.8298	4 29 36.7	13.172
8	13 22 26.63	1.8324	4 42 46.8	13.164
9	13 24 16.65	1.8350	4 55 56.4	13.156
10	13 26 6.83	1.8377	5 9 5.5	13 147
11	13 27 57.17	1.8404	5 22 14.0	13.137
12	13 29 47.67	1.8432	5 35 21.9	13.126
13	13 31 38.35	1.8461	5 48 29.1	13.114
14	13 33 29.21	1.8491	6 1 35.6	13.102
15	13 35 20.24	1.8521	6 14 41.4	13.089
16	13 37 11.46	1.8552	6 27 46.3	13.075
17	13 39 2.87	1.8584	6 40 50.4	13.061
18	13 40 54.47	1.8617	6 53 53.6	13.045
19	13 42 46.27	1.8651	7 6 55.8	13.029
20	13 44 38.28	1.8685	7 19 57.1	13.012
21	13 46 30.49	1.8720	7 32 57.3	12.993
22	13 48 22.92	1.8756	7 45 56.3	12.974
23	13 50 15.56	1.8792	7 58 54.2	12.955
24	13 52 8.42	1.8828	S. 8 11 50.9	12.934

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 52 8.42	1.8828	S. 8 11 50.9	12.934
1	13 54 1.50	1.8867	8 24 46.3	12.912
2	13 55 54.82	1.8906	8 37 40.4	12.890
3	13 57 48.37	1.8945	8 50 33.1	12.867
4	13 59 42.16	1.8985	9 3 24.4	12.842
5	14 1 36.19	1.9026	9 16 14.2	12.817
6	14 3 30.47	1.9067	9 29 2.5	12.792
7	14 5 25.00	1.9110	9 41 49.2	12.765
8	14 7 19.79	1.9153	9 54 34.3	12.737
9	14 9 14.84	1.9197	10 7 17.6	12.707
10	14 11 10.15	1.9240	10 19 59.1	12.677
11	14 13 5.72	1.9284	10 32 38.8	12.647
12	14 15 1.56	1.9330	10 45 16.7	12.615
13	14 16 57.68	1.9377	10 57 52.6	12.582
14	14 18 54.09	1.9425	11 10 26.5	12.548
15	14 20 50.78	1.9473	11 22 58.3	12.513
16	14 22 47.76	1.9522	11 35 28.0	12.477
17	14 24 45.04	1.9571	11 47 55.5	12.439
18	14 26 42.61	1.9620	12 0 20.7	12.401
19	14 28 40.48	1.9671	12 12 43.6	12.362
20	14 30 38.66	1.9723	12 25 4.2	12.322
21	14 32 37.15	1.9775	12 37 22.3	12.281
22	14 34 35.96	1.9827	12 49 37.9	12.238
23	14 36 35.08	1.9880	S. 13 1 50.9	12.194

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 38 34.52	1.9934	S. 13 14 1.2	12.149
1	14 40 34.29	1.9989	13 26 8.8	12.104
2	14 42 34.39	2.0043	13 38 13.7	12.057
3	14 44 34.81	2.0098	13 50 15.7	12.009
4	14 46 35.57	2.0155	14 2 14.8	11.960
5	14 48 36.68	2.0213	14 14 10.9	11.909
6	14 50 38.13	2.0271	14 26 3.9	11.857
7	14 52 39.93	2.0329	14 37 53.8	11.805
8	14 54 42.08	2.0387	14 49 40.5	11.751
9	14 56 44.58	2.0447	15 1 23.9	11.696
10	14 58 47.44	2.0507	15 13 4.0	11.639
11	15 0 50.66	2.0567	15 24 40.6	11.581
12	15 2 54.25	2.0628	15 36 13.7	11.522
13	15 4 58.20	2.0689	15 47 43.2	11.462
14	15 7 2.52	2.0752	15 59 9.1	11.401
15	15 9 7.22	2.0815	16 10 31.3	11.338
16	15 11 12.30	2.0878	16 21 49.7	11.274
17	15 13 17.76	2.0942	16 33 4.2	11.208
18	15 15 23.60	2.1006	16 44 14.7	11.142
19	15 17 29.83	2.1071	16 55 21.2	11.074
20	15 19 36.45	2.1135	17 6 23.6	11.004
21	15 21 43.45	2.1200	17 17 21.7	10.933
22	15 23 50.85	2.1267	17 28 15.5	10.861
23	15 25 58.65	2.1333	17 39 5.0	10.788
24	15 28 6.85	2.1400	S. 17 49 50.1	10.713

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 28 6.85	2.1400	S. 17 49 50.1	10.713
1	15 30 15.45	2.1467	18 0 30.6	10.637
2	15 32 24.45	2.1534	18 11 6.5	10.559
3	15 34 33.86	2.1602	18 21 37.7	10.480
4	15 36 43.68	2.1671	18 32 4.1	10.400
5	15 38 53.91	2.1739	18 42 25.7	10.318
6	15 41 4.55	2.1808	18 52 42.3	10.235
7	15 43 15.61	2.1877	19 2 53.9	10.151
8	15 45 27.08	2.1946	19 13 0.4	10.064
9	15 47 38.96	2.2015	19 23 1.6	9.976
10	15 49 51.26	2.2085	19 32 57.5	9.887
11	15 52 3.98	2.2155	19 42 48.1	9.797
12	15 54 17.12	2.2225	19 52 33.2	9.705
13	15 56 30.68	2.2296	20 2 12.7	9.612
14	15 58 44.67	2.2367	20 11 46.6	9.517
15	16 0 59.08	2.2437	20 21 14.8	9.421
16	16 3 13.92	2.2508	20 30 37.1	9.322
17	16 5 29.18	2.2578	20 39 53.5	9.223
18	16 7 44.86	2.2649	20 49 3.9	9.122
19	16 10 0.97	2.2721	20 58 8.2	9.020
20	16 12 17.51	2.2792	21 7 6.3	8.917
21	16 14 34.47	2.2862	21 15 58.2	8.812
22	16 16 51.86	2.2933	21 24 43.7	8.704
23	16 19 9.67	2.3003	S. 21 33 22.7	8.596

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 21 27.90	2.3074	S. 21 41 55.2	8.487
1	16 23 46.56	2.3145	21 50 21.1	8.375
2	16 26 5.64	2.3216	21 58 40.2	8.262
3	16 28 25.15	2.3287	22 6 52.5	8.148
4	16 30 45.08	2.3356	22 14 57.9	8.033
5	16 33 5.42	2.3425	22 22 56.4	7.915
6	16 35 26.18	2.3495	22 30 47.7	7.795
7	16 37 47.36	2.3564	22 38 31.8	7.675
8	16 40 8.95	2.3633	22 46 8.7	7.553
9	16 42 30.96	2.3702	22 53 38.2	7.430
10	16 44 53.38	2.3771	23 1 0.3	7.306
11	16 47 16.21	2.3838	23 8 14.9	7.179
12	16 49 39.44	2.3906	23 15 21.8	7.051
13	16 52 3.08	2.3973	23 22 21.0	6.922
14	16 54 27.12	2.4039	23 29 12.4	6.792
15	16 56 51.55	2.4105	23 35 56.0	6.660
16	16 59 16.38	2.4171	23 42 31.6	6.527
17	17 1 41.60	2.4236	23 48 59.2	6.391
18	17 4 7.21	2.4301	23 55 18.6	6.254
19	17 6 33.21	2.4364	24 1 29.7	6.117
20	17 8 59.58	2.4427	24 7 32.6	5.978
21	17 11 26.33	2.4489	24 13 27.1	5.837
22	17 13 53.45	2.4551	24 19 13.1	5.696
23	17 16 20.94	2.4612	24 24 50.6	5.552
24	17 18 48.79	2.4672	S. 21 30 19.4	5.407

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 18 48.79	2.4672	S.24 30 19.4	5.407
1	17 21 17.00	2.4732	24 35 39.5	5.262
2	17 23 45.57	2.4790	24 40 50.8	5.115
3	17 26 14.48	2.4847	24 45 53.3	4.967
4	17 28 43.73	2.4903	24 50 46.8	4.817
5	17 31 13.32	2.4959	24 55 31.3	4.665
6	17 33 43.24	2.5014	25 0 6.6	4.513
7	17 36 13.49	2.5067	25 4 32.8	4.360
8	17 38 44.05	2.5119	25 8 49.8	4.205
9	17 41 14.92	2.5171	25 12 57.4	4.049
10	17 43 46.10	2.5222	25 16 55.7	3.893
11	17 46 17.59	2.5272	25 20 44.6	3.735
12	17 48 49.37	2.5320	25 24 23.9	3.575
13	17 51 21.43	2.5367	25 27 53.6	3.415
14	17 53 53.78	2.5414	25 31 13.7	3.255
15	17 56 26.40	2.5458	25 34 24.2	3.093
16	17 58 59.28	2.5502	25 37 24.9	2.929
17	18 1 32.42	2.5544	25 40 15.7	2.764
18	18 4 5.81	2.5585	25 42 56.6	2.599
19	18 6 39.44	2.5625	25 45 27.6	2.434
20	18 9 13.31	2.5663	25 47 48.7	2.267
21	18 11 47.40	2.5700	25 49 59.7	2.099
22	18 14 21.71	2.5736	25 52 0.6	1.931
23	18 16 56.23	2.5771	S.25 53 51.4	1.762

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 19 30.96	2.5804	S.25 55 32.0	1.592
1	18 22 5.88	2.5835	25 57 2.4	1.421
2	18 24 40.98	2.5865	25 58 22.5	1.250
3	18 27 16.26	2.5894	25 59 32.4	1.078
4	18 29 51.71	2.5921	26 0 31.9	0.906
5	18 32 27.31	2.5946	26 1 21.1	0.733
6	18 35 3.06	2.5970	26 1 59.9	0.559
7	18 37 38.95	2.5992	26 2 28.2	0.385
8	18 40 14.97	2.6014	26 2 46.1	0.211
9	18 42 51.12	2.6034	26 2 53.5	− 0.036
10	18 45 27.38	2.6052	26 2 50.4	+ 0.140
11	18 48 3.74	2.6068	26 2 36.7	0.316
12	18 50 40.20	2.6083	26 2 12.5	0.492
13	18 53 16.74	2.6097	26 1 37.7	0.668
14	18 55 53.36	2.6109	26 0 52.3	0.844
15	18 58 30.05	2.6119	25 59 56.4	1.021
16	19 1 6.79	2.6127	25 58 49.8	1.198
17	19 3 43.58	2.6135	25 57 32.6	1.375
18	19 6 20.41	2.6141	25 56 4.8	1.552
19	19 8 57.27	2.6145	25 54 26.4	1.729
20	19 11 34.15	2.6147	25 52 37.3	1.906
21	19 14 11.04	2.6148	25 50 37.6	2.083
22	19 16 47.93	2.6147	25 48 27.3	2.260
23	19 19 24.81	2.6146	25 46 6.4	2.437
24	19 22 1.68	2.6142	S.25 43 34.9	2.613

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 22 1.68	2.6142	S.25 43 34.9	2.613
1	19 24 38.52	2.6137	25 40 52.8	2.790
2	19 27 15.32	2.6130	25 38 0.1	2.967
3	19 29 52.08	2.6122	25 34 56.8	3.143
4	19 32 28.79	2.6112	25 31 43.0	3.318
5	19 35 5.43	2.6101	25 28 18.7	3.493
6	19 37 42.00	2.6088	25 24 43.8	3.668
7	19 40 18.49	2.6074	25 20 58.5	3.843
8	19 42 54.89	2.6059	25 17 2.7	4.017
9	19 45 31.20	2.6042	25 12 56.5	4.190
10	19 48 7.40	2.6023	25 8 39.9	4.362
11	19 50 43.48	2.6003	25 4 13.0	4.535
12	19 53 19.44	2.5982	24 59 35.7	4.707
13	19 55 55.27	2.5960	24 54 48.1	4.878
14	19 58 30.96	2.5937	24 49 50.3	5.048
15	20 1 6.51	2.5912	24 44 42.3	5.218
16	20 3 41.90	2.5885	24 39 24.1	5.387
17	20 6 17.13	2.5857	24 33 55.8	5.555
18	20 8 52.19	2.5828	24 28 17.5	5.722
19	20 11 27.07	2.5798	24 22 29.2	5.888
20	20 14 1.77	2.5767	24 16 30.9	6.055
21	20 16 36.28	2.5735	24 10 22.6	6.221
22	20 19 10.59	2.5701	24 4 4.4	6.384
23	20 21 44.69	2.5667	S.23 57 36.5	6.546

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 24 18.59	2.5632	S.23 50 58.9	6.708
1	20 26 52.27	2.5595	23 44 11.6	6.869
2	20 29 25.73	2.5557	23 37 14.6	7.029
3	20 31 58.95	2.5518	23 30 8.1	7.187
4	20 34 31.94	2.5478	23 22 52.1	7.345
5	20 37 4.69	2.5437	23 15 26.7	7.501
6	20 39 37.19	2.5396	23 7 52.0	7.656
7	20 42 9.44	2.5354	23 0 8.0	7.810
8	20 44 41.43	2.5311	22 52 14.8	7.963
9	20 47 13.17	2.5267	22 44 12.4	8.115
10	20 49 44.64	2.5222	22 36 1.0	8.265
11	20 52 15.83	2.5176	22 27 40.6	8.414
12	20 54 46.75	2.5130	22 19 11.3	8.562
13	20 57 17.39	2.5083	22 10 33.2	8.708
14	20 59 47.74	2.5035	22 1 46.3	8.853
15	21 2 17.81	2.4987	21 52 50.8	8.996
16	21 4 47.59	2.4938	21 43 46.8	9.138
17	21 7 17.07	2.4889	21 34 34.2	9.280
18	21 9 46.26	2.4840	21 25 13.2	9.419
19	21 12 15.15	2.4789	21 15 43.9	9.557
20	21 14 43.73	2.4738	21 6 6.4	9.693
21	21 17 12.00	2.4687	20 56 20.7	9.829
22	21 19 39.97	2.4636	20 46 26.9	9.962
23	21 22 7.63	2.4583	20 36 25.2	10.094
24	21 24 34.97	2.4531	S.20 26 15.6	10.225

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 24 34.97	2.4531	S. 20 26 15.6	10.225
1	21 27 2.00	2.4478	20 15 58.2	10.354
2	21 29 28.71	2.4425	20 5 33.1	10.482
3	21 31 55.10	2.4372	19 55 0.4	10.608
4	21 34 21.17	2.4318	19 44 20.2	10.732
5	21 36 46.92	2.4265	19 33 32.6	10.854
6	21 39 12.35	2.4212	19 22 37.7	10.976
7	21 41 37.46	2.4158	19 11 35.5	11.096
8	21 44 2.24	2.4103	19 0 26.2	11.213
9	21 46 26.70	2.4049	18 49 9.9	11.329
10	21 48 50.83	2.3995	18 37 46.7	11.444
11	21 51 14.64	2.3941	18 26 16.6	11.558
12	21 53 38.12	2.3887	18 14 39.7	11.670
13	21 56 1.28	2.3832	18 2 56.2	11.780
14	21 58 24.11	2.3778	17 51 6.1	11.888
15	22 0 46.62	2.3724	17 39 9.6	11.995
16	22 3 8.80	2.3670	17 27 6.7	12.100
17	22 5 30.66	2.3617	17 14 57.6	12.203
18	22 7 52.20	2.3563	17 2 42.3	12.305
19	22 10 13.42	2.3510	16 50 21.0	12.405
20	22 12 34.32	2.3456	16 37 53.7	12.504
21	22 14 54.89	2.3403	16 25 20.5	12.601
22	22 17 15.15	2.3350	16 12 41.6	12.696
23	22 19 35.09	2.3298	S. 15 59 57.0	12.790

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 21 54.72	2.3246	S. 15 47 6.8	12.882
1	22 24 14.04	2.3194	15 34 11.2	12.972
2	22 26 33.05	2.3142	15 21 10.2	13.061
3	22 28 51.74	2.3090	15 8 3.9	13.148
4	22 31 10.13	2.3039	14 54 52.5	13.233
5	22 33 28.21	2.2988	14 41 36.0	13.317
6	22 35 45.99	2.2938	14 28 14.5	13.398
7	22 38 3.47	2.2889	14 14 48.2	13.478
8	22 40 20.66	2.2840	14 1 17.1	13.557
9	22 42 37.55	2.2791	13 47 41.3	13.635
10	22 44 54.15	2.2742	13 34 0.9	13.711
11	22 47 10.46	2.2694	13 20 16.0	13.784
12	22 49 26.48	2.2647	13 6 26.8	13.856
13	22 51 42.22	2.2600	12 52 33.3	13.927
14	22 53 57.68	2.2553	12 38 35.6	13.996
15	22 56 12.86	2.2507	12 24 33.8	14.063
16	22 58 27.77	2.2462	12 10 28.0	14.129
17	23 0 42.41	2.2417	11 56 18.3	14.192
18	23 2 56.78	2.2372	11 42 4.9	14.254
19	23 5 10.88	2.2329	11 27 47.8	14.316
20	23 7 24.73	2.2287	11 13 27.0	14.376
21	23 9 38.32	2.2244	10 59 2.6	14.434
22	23 11 51.66	2.2203	10 44 34.9	14.489
23	23 14 4.75	2.2162	10 30 3.9	14.544
24	23 16 17.60	2.2121	S. 10 15 29.6	14.597

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 16 17.60	2.2121	S. 10 15 29.6	14.597
1	23 18 30.20	2.2081	10 0 52.2	14.648
2	23 20 42.57	2.2042	9 46 11.8	14.697
3	23 22 54.71	2.2004	9 31 28.5	14.746
4	23 25 6.62	2.1967	9 16 42.3	14.793
5	23 27 18.31	2.1930	9 1 53.3	14.838
6	23 29 29.77	2.1893	8 47 1.7	14.882
7	23 31 41.02	2.1857	8 32 7.5	14.924
8	23 33 52.06	2.1822	8 17 10.8	14.964
9	23 36 2.88	2.1787	8 2 11.8	15.003
10	23 38 13.50	2.1754	7 47 10.5	15.041
11	23 40 23.93	2.1722	7 32 6.9	15.077
12	23 42 34.17	2.1690	7 17 1.2	15.112
13	23 44 44.21	2.1658	7 1 53.5	15.144
14	23 46 54.07	2.1628	6 46 43.9	15.176
15	23 49 3.75	2.1599	6 31 32.4	15.207
16	23 51 13.26	2.1570	6 16 19.1	15.235
17	23 53 22.59	2.1541	6 1 4.2	15.261
18	23 55 31.75	2.1513	5 45 47.8	15.286
19	23 57 40.75	2.1487	5 30 29.9	15.311
20	23 59 49.60	2.1462	5 15 10.5	15.334
21	0 1 58.29	2.1436	4 59 49.8	15.355
22	0 4 6.83	2.1412	4 44 27.9	15.374
23	0 6 15.23	2.1389	S. 4 29 4.9	15.393

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 8 23.50	2.1367	S. 4 13 40.8	15.410
1	0 10 31.63	2.1344	3 58 15.7	15.425
2	0 12 39.63	2.1322	3 42 49.8	15.438
3	0 14 47.50	2.1302	3 27 23.1	15.451
4	0 16 55.26	2.1283	3 11 55.6	15.463
5	0 19 2.90	2.1264	2 56 27.5	15.473
6	0 21 10.43	2.1246	2 40 58.9	15.481
7	0 23 17.85	2.1229	2 25 29.8	15.488
8	0 25 25.18	2.1213	2 10 0.3	15.493
9	0 27 32.41	2.1197	1 54 30.6	15.497
10	0 29 39.55	2.1183	1 39 0.7	15.500
11	0 31 46.61	2.1169	1 23 30.6	15.502
12	0 33 53.58	2.1156	1 8 0.5	15.502
13	0 36 0.48	2.1144	0 52 30.4	15.501
14	0 38 7.31	2.1132	0 37 0.4	15.498
15	0 40 14.07	2.1122	0 21 30.7	15.493
16	0 42 20.77	2.1112	S. 0 6 1.3	15.488
17	0 44 27.41	2.1103	N. 0 9 27.8	15.482
18	0 46 34.00	2.1095	0 24 56.5	15.473
19	0 48 40.55	2.1088	0 40 24.6	15.463
20	0 50 47.06	2.1081	0 55 52.1	15.452
21	0 52 53.52	2.1074	1 11 18.9	15.440
22	0 54 59.95	2.1070	1 26 44.9	15.427
23	0 57 6.36	2.1066	1 42 10.1	15.412
24	0 59 12.74	2.1062	N. 1 57 34.3	15.395

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 29.			
	h m s	s	° ′ ″	″
0	0 59 12.74	2.1062	N. 1 57 34.3	15.395
1	1 1 19.10	2.1059	2 12 57.5	15.377
2	1 3 25.45	2.1058	2 28 19.6	15.359
3	1 5 31.80	2.1057	2 43 40.6	15.339
4	1 7 38.14	2.1057	2 59 0.3	15.317
5	1 9 44.48	2.1057	3 14 18.7	15.295
6	1 11 50.83	2.1058	3 29 35.7	15.271
7	1 13 57.18	2.1060	3 44 51.2	15.245
8	1 16 3.55	2.1063	4 0 5.1	15.218
9	1 18 9.94	2.1067	4 15 17.4	15.191
10	1 20 16.35	2.1071	4 30 28.0	15.162
11	1 22 22.79	2.1077	4 45 36.8	15.130
12	1 24 29.27	2.1083	5 0 43.6	15.098
13	1 26 35.79	2.1090	5 15 48.5	15.065
14	1 28 42.35	2.1097	5 30 51.4	15.031
15	1 30 48.95	2.1104	5 45 52.2	14.995
16	1 32 55.60	2.1112	6 0 50.8	14.958
17	1 35 2.30	2.1122	6 15 47.2	14.920
18	1 37 9.06	2.1133	6 30 41.2	14.880
19	1 39 15.89	2.1144	6 45 32.8	14.839
20	1 41 22.79	2.1155	7 0 21.9	14.797
21	1 43 29.75	2.1167	7 15 8.4	14.753
22	1 45 36.79	2.1181	7 29 52.3	14.709
23	1 47 43.92	2.1195	N. 7 44 33.5	14.663
	TUESDAY 30.			
0	1 49 51.13	2.1209	N. 7 59 11.9	14.616
1	1 51 58.43	2.1224	8 13 47.4	14.567
2	1 54 5.82	2.1239	8 28 20.0	14.517
3	1 56 13.30	2.1256	8 42 49.5	14.466
4	1 58 20.89	2.1273	8 57 15.9	14.414
5	2 0 28.58	2.1291	9 11 39.2	14.361
6	2 2 36.38	2.1309	9 25 59.2	14.305
7	2 4 44.29	2.1328	9 40 15.8	14.249
8	2 6 52.32	2.1348	9 54 29.1	14.192
9	2 9 0.47	2.1368	10 8 38.9	14.134
10	2 11 8.74	2.1388	10 22 45.2	14.074
11	2 13 17.13	2.1409	10 36 47.8	14.012
12	2 15 25.65	2.1432	10 50 46.7	13.950
13	2 17 34.31	2.1454	11 4 41.8	13.887
14	2 19 43.10	2.1477	11 18 33.1	13.823
15	2 21 52.03	2.1501	11 32 20.5	13.757
16	2 24 1.11	2.1525	11 46 3.9	13.689
17	2 26 10.33	2.1549	11 59 43.2	13.620
18	2 28 19.70	2.1574	12 13 18.3	13.550
19	2 30 29.22	2.1600	12 26 49.2	13.479
20	2 32 38.90	2.1627	12 40 15.8	13.407
21	2 34 48.74	2.1653	12 53 38.1	13.334
22	2 36 58.74	2.1680	13 6 55.9	13.259
23	2 39 8.90	2.1708	13 20 9.2	13.183
24	2 41 19.23	2.1736	N.13 33 17.9	13.106

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	2 41 19.23	2.1736	N.13 33 17.9	13.106

PHASES OF THE MOON.

		d	h	m
● New Moon . .	June	6	4	26.2
☽ First Quarter . . .		14	0	33.9
○ Full Moon		21	17	12.1
☾ Last Quarter		28	11	15.9

		d	h
☾ Apogee. . . .	June	13	12.0
☾ Perigee.		25	16.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Antares	W.	114° 35′ 55″	2291	116° 22′ 7″	2293	118° 8′ 17″	2294	119° 54′ 25″	2296
	α Aquilæ	W.	69 22 15	3198	70 48 26	3180	72 14 59	3163	73 41 53	3148
	Fomalhaut	W.	34 22 19	2831	35 56 7	2786	37 30 53	2747	39 6 30	2713
	Venus	E.	38 26 22	2659	36 48 47	2660	35 11 14	2661	33 33 42	2663
	Sun	E.	67 19 9	2579	65 39 45	2580	64 0 22	2581	62 21 1	2582
2	α Aquilæ	W.	81 0 7	3101	82 28 16	3096	83 56 39	3094	85 24 47	3093
	Fomalhaut	W.	47 13 59	2602	48 52 51	2588	50 32 2	2576	52 11 30	2566
	α Pegasi	W.	34 22 12	3891	35 35 41	3756	36 51 29	3641	38 9 19	3541
	Sun	E.	54 4 43	2591	52 25 36	2593	50 46 32	2596	49 7 32	2600
3	α Aquilæ	W.	92 45 54	3110	94 13 51	3119	95 41 38	3129	97 9 13	3139
	Fomalhaut	W.	60 31 41	2535	62 12 5	2533	63 52 32	2531	65 33 2	2531
	α Pegasi	W.	45 2 10	3197	46 28 23	3152	47 55 30	3111	49 23 26	3076
	Sun	E.	40 53 46	2620	39 15 18	2625	37 36 57	2630	35 58 43	2635
4	α Aquilæ	W.	104 23 5	3922	105 48 48	3943	107 14 6	3968	108 38 55	3994
	Fomalhaut	W.	73 55 18	2540	75 35 35	2544	77 15 47	2549	78 55 52	2554
	α Pegasi	W.	56 52 21	2955	58 23 30	2940	59 54 58	2927	61 26 42	2917
	Sun	E.	27 49 35	2669	26 12 13	2677	24 35 2	2684	22 58 1	2693
7	Sun	W.	10 13 39	2939	11 45 9	2950	13 16 25	2961	14 47 27	2972
	Regulus	E.	61 51 7	2617	60 12 35	2631	58 34 22	2644	56 56 27	2657
	Spica	E.	115 54 19	2624	114 15 56	2635	112 37 49	2647	110 59 58	2660
8	Sun	W.	22 18 46	3038	23 48 12	3051	25 17 22	3065	26 46 14	3079
	Regulus	E.	48 51 27	2727	47 15 23	2742	45 39 39	2756	44 4 14	2772
	Spica	E.	102 54 54	2722	101 18 44	2735	99 42 51	2748	98 7 15	2760
9	Sun	W.	34 6 24	3147	35 33 37	3160	37 0 34	3174	38 27 14	3187
	Regulus	E.	36 12 7	2848	34 38 41	2864	33 5 36	2880	31 32 52	2896
	Spica	E.	90 13 25	2624	88 39 28	2637	87 5 48	2649	85 32 24	2662
10	Sun	W.	45 36 47	3949	47 1 58	3961	48 26 55	3973	49 51 38	3984
	Pollux	W.	13 7 20	2985	14 37 51	2985	16 8 22	2985	17 38 53	2988
	Spica	E.	77 49 17	2920	76 17 24	2932	74 45 46	2942	73 14 21	2954
	Antares	E.	123 43 28	2916	122 11 29	2926	120 39 43	2936	119 8 10	2946
11	Sun	W.	56 52 4	3336	58 15 34	3345	59 38 54	3354	61 2 3	3363
	Pollux	W.	25 10 30	3008	26 40 33	3013	28 10 30	3018	29 40 20	3023
	Spica	E.	65 40 36	3004	64 10 28	3013	62 40 31	3022	61 10 45	3030
	Antares	E.	111 33 28	2992	110 3 5	3001	108 32 53	3008	107 2 50	3016
12	Sun	W.	67 55 34	3398	69 17 53	3404	70 40 5	3409	72 2 11	3415
	Pollux	W.	37 7 50	3050	38 37 1	3056	40 6 6	3059	41 35 6	3062
	Spica	E.	53 44 28	3069	52 15 40	3075	50 47 0	3082	49 18 28	3088
	Antares	E.	99 34 49	3048	98 5 36	3053	96 36 29	3058	95 7 28	3062
13	Sun	W.	78 51 30	3431	80 13 12	3433	81 34 51	3434	82 56 29	3435
	Pollux	W.	48 59 8	3075	50 27 48	3076	51 56 27	3078	53 25 4	3078
	Spica	E.	41 57 33	3114	40 29 41	3119	39 1 54	3124	37 34 13	3129
	Antares	E.	87 43 33	3078	86 14 56	3080	84 46 22	3081	83 17 49	3082

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Antares	W.	121° 40′ 30″	2298	123° 26′ 33″	2300	125° 12′ 32″	2302	126° 58′ 28″	2305
	α Aquilæ	W.	75 9 5	3135	76 36 32	3124	78 4 13	3114	79 32 5	3106
	Fomalhaut	W.	40 42 52	2685	42 19 52	2660	43 57 26	2638	45 35 30	2619
	Venus	E.	31 56 12	2663	30 18 43	2666	28 41 17	2667	27 3 53	2669
	Sun	E.	60 41 41	2583	59 2 23	2585	57 23 7	2587	55 43 54	2588
2	α Aquilæ	W.	86 53 5	3093	88 21 23	3096	89 49 38	3099	91 17 49	3104
	Fomalhaut	W.	53 51 12	2557	55 31 6	2550	57 11 10	2544	58 51 22	2539
	α Pegasi	W.	39 28 58	3454	40 50 14	3376	42 12 58	3309	43 36 59	3249
	Sun	E.	47 28 37	2603	45 49 46	2607	44 11 0	2611	42 32 20	2615
3	α Aquilæ	W.	98 36 35	3153	100 3 41	3168	101 30 29	3183	102 56 58	3202
	Fomalhaut	W.	67 13 32	2531	68 54 2	2533	70 34 30	2534	72 14 56	2537
	α Pegasi	W.	50 52 5	3045	52 21 22	3018	53 51 13	2993	55 21 34	2973
	Sun	E.	34 20 36	2641	32 42 37	2648	31 4 47	2655	29 27 6	2662
4	α Aquilæ	W.	110 3 14	3322	111 27 0	3353	112 50 10	3386	114 12 42	3422
	Fomalhaut	W.	80 35 50	2560	82 15 40	2567	83 55 20	2574	85 34 50	2582
	α Pegasi	W.	62 58 39	2909	64 30 47	2901	66 3 4	2897	67 35 27	2892
	Sun	E.	21 21 12	2702	19 44 35	2711	18 8 10	2721	16 31 58	2733
7	Sun	W.	16 18 15	2985	17 48 47	2997	19 19 3	3010	20 49 3	3024
	Regulus	E.	55 18 50	2671	53 41 31	2685	52 4 31	2699	50 27 50	2713
	Spica	E.	109 22 24	2672	107 45 6	2684	106 8 5	2697	104 31 21	2710
8	Sun	W.	28 14 49	3093	29 43 7	3106	31 11 9	3119	32 38 55	3133
	Regulus	E.	42 29 9	2787	40 54 24	2801	39 19 58	2818	37 45 53	2832
	Spica	E.	96 31 55	2774	94 56 53	2786	93 22 7	2799	91 47 38	2811
9	Sun	W.	39 53 39	3200	41 19 48	3213	42 45 42	3225	44 11 22	3237
	Regulus	E.	30 0 31	2916	28 28 33	2935	26 56 59	2954	25 25 49	2974
	Spica	E.	83 59 16	2873	82 26 23	2886	80 53 46	2898	79 21 24	2909
10	Sun	W.	51 16 8	3295	52 40 25	3306	54 4 30	3316	55 28 23	3326
	Pollux	W.	19 9 21	2990	20 39 46	2994	22 10 6	2998	23 40 21	3003
	Spica	E.	71 43 10	2964	70 12 12	2975	68 41 28	2985	67 10 56	2994
	Antares	E.	117 36 50	2956	116 5 42	2965	114 34 46	2974	113 4 1	2984
11	Sun	W.	62 25 3	3371	63 47 53	3378	65 10 35	3386	66 33 8	3392
	Pollux	W.	31 10 4	3030	32 39 40	3034	34 9 10	3040	35 38 33	3045
	Spica	E.	59 41 10	3039	58 11 45	3047	56 42 30	3054	55 13 24	3062
	Antares	E.	105 32 57	3023	104 3 13	3030	102 33 37	3036	101 4 9	3043
12	Sun	W.	73 24 11	3418	74 46 7	3423	76 7 58	3426	77 29 45	3428
	Pollux	W.	43 4 2	3066	44 32 53	3069	46 1 41	3071	47 30 26	3073
	Spica	E.	47 50 4	3094	46 21 47	3099	44 53 36	3104	43 25 31	3110
	Antares	E.	93 38 32	3066	92 9 41	3070	90 40 55	3073	89 12 12	3076
13	Sun	W.	84 18 6	3436	85 39 42	3435	87 1 19	3434	88 22 57	3433
	Pollux	W.	54 53 41	3078	56 22 18	3077	57 50 56	3076	59 19 35	3075
	Spica	E.	36 6 38	3133	34 39 8	3138	33 11 44	3142	31 44 25	3148
	Antares	E.	81 49 17	3082	80 20 46	3082	78 52 14	3082	77 23 42	3080

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
14	Sun	W.	89° 44′ 36″	3431	91° 6′ 17″	3429	92° 28′ 1″	3426	93° 49′ 48″	3423
	Pollux	W.	60 48 15	3073	62 16 58	3070	63 45 44	3068	65 14 33	3065
	Regulus	W.	24 54 49	3147	26 22 2	3137	27 49 27	3128	29 17 3	3119
	Spica	E.	30 17 13	3153	28 50 8	3159	27 23 10	3167	25 56 21	3176
	Antares	E.	75 55 8	3078	74 26 32	3077	72 57 54	3074	71 29 13	3072
15	Sun	W.	100 39 53	3398	102 2 12	3392	103 24 38	3385	104 47 12	3377
	Pollux	W.	72 39 51	3041	74 9 13	3034	75 38 43	3028	77 8 21	3022
	Regulus	W.	36 37 43	3076	38 6 22	3067	39 35 12	3059	41 4 12	3049
	Antares	E.	64 4 44	3050	62 35 33	3044	61 6 15	3039	59 36 50	3032
	α Aquilæ	E.	109 34 29	3942	108 21 52	3921	107 8 54	3901	105 55 35	3881
16	Sun	W.	111 42 20	3333	113 5 53	3394	114 29 37	3313	115 53 34	3302
	Pollux	W.	84 38 49	2980	86 9 27	2971	87 40 16	2961	89 11 18	2951
	Regulus	W.	48 32 7	3001	50 2 19	2990	51 32 44	2960	53 3 22	2969
	Antares	E.	52 7 36	2994	50 37 16	2986	49 6 46	2977	47 36 5	2968
	α Aquilæ	E.	99 44 9	3792	98 28 58	3776	97 13 31	3761	95 57 48	3746
17	Sun	W.	122 56 36	3242	124 21 55	3229	125 47 30	3216	127 13 20	3203
	Pollux	W.	96 49 46	2895	98 22 11	2883	99 54 51	2871	101 27 47	2858
	Regulus	W.	60 40 9	2909	62 12 16	2896	63 44 40	2883	65 17 20	2871
	Antares	E.	39 59 43	2920	38 27 50	2910	36 55 44	2900	35 23 25	2890
	α Aquilæ	E.	89 35 33	3682	88 18 27	3671	87 1 9	3661	85 43 40	3651
	Fomalhaut	E.	122 7 58	3125	120 40 19	3105	119 12 16	3087	117 43 50	3068
18	Pollux	W.	109 16 38	2792	110 51 16	2778	112 26 13	2764	114 1 28	2750
	Regulus	W.	73 4 57	2802	74 39 22	2788	76 14 6	2773	77 49 9	2760
	Spica	W.	19 31 27	2966	21 2 22	2928	22 34 5	2894	24 6 31	2865
	α Aquilæ	E.	79 14 1	3617	77 55 45	3612	76 37 24	3610	75 19 1	3609
	Fomalhaut	E.	110 15 58	2977	108 45 16	2960	107 14 13	2942	105 42 48	2925
19	Regulus	W.	85 49 8	2687	87 26 6	2672	89 3 24	2657	90 41 2	2642
	Spica	W.	31 57 26	2744	33 33 8	2722	35 9 18	2703	36 45 54	2684
	α Aquilæ	E.	68 47 7	3623	67 28 57	3630	66 10 55	3640	64 53 4	3653
	Fomalhaut	E.	98 0 22	2843	96 26 50	2828	94 52 58	2812	93 18 46	2797
	α Pegasi	E.	115 44 37	3178	114 18 2	3151	112 50 54	3124	111 23 14	3099
20	Regulus	W.	98 54 8	2571	100 33 43	2556	102 13 38	2543	103 53 52	2529
	Spica	W.	44 55 3	2596	46 34 3	2580	48 13 26	2564	49 53 11	2548
	α Aquilæ	E.	58 28 14	3761	57 12 31	3793	55 57 22	3830	54 42 51	3873
	Fomalhaut	E.	85 22 55	2726	83 46 50	2713	82 10 27	2701	80 33 48	2686
	α Pegasi	E.	103 57 33	2987	102 27 4	2967	100 56 10	2948	99 24 52	2931
21	Regulus	W.	112 19 40	2465	114 1 43	2452	115 44 4	2441	117 26 41	2429
	Spica	W.	58 17 12	2475	59 59 0	2462	61 41 7	2448	63 23 33	2436
	Fomalhaut	E.	72 26 41	2636	70 48 35	2627	69 10 17	2619	67 31 48	2612
	α Pegasi	E.	91 43 4	2854	90 9 46	2841	88 36 11	2829	87 2 21	2819
22	Spica	W.	72 0 4	2378	73 44 11	2367	75 28 33	2357	77 13 10	2348
	Antares	W.	26 10 5	2414	27 53 20	2397	29 36 59	2382	31 20 59	2368
	Fomalhaut	E.	59 17 27	2592	57 38 21	2591	55 59 14	2592	54 20 8	2594
	α Pegasi	E.	79 10 9	2780	77 35 15	2776	76 0 16	2772	74 25 12	2771

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
14	Sun	W.	95 11 39	3418	96 33 35	3415	97 55 35	3409	99 17 41	3404
	Pollux	W.	66 43 26	3060	68 12 24	3056	69 41 27	3052	71 10 36	3047
	Regulus	W.	30 44 50	3110	32 12 48	3101	33 40 56	3093	35 9 14	3084
	Spica	E.	24 29 43	3186	23 3 17	3199	21 37 7	3215	20 11 16	3236
	Antares	E.	70 0 29	3068	68 31 40	3065	67 2 47	3060	65 33 48	3056
15	Sun	W.	106 9 55	3369	107 32 47	3361	108 55 48	3352	110 18 59	3344
	Pollux	W.	78 38 7	3014	80 8 3	3006	81 38 8	2998	83 8 23	2989
	Regulus	W.	42 33 24	3040	44 2 47	3031	45 32 21	3021	47 2 8	3011
	Antares	E.	58 7 17	3025	56 37 35	3018	55 7 45	3010	53 37 45	3003
	α Aquilæ	E.	104 41 56	3861	103 27 57	3843	102 13 39	3825	100 59 3	3808
16	Sun	W.	117 17 43	3290	118 42 6	3279	120 6 42	3267	121 31 32	3256
	Pollux	W.	90 42 32	2940	92 14 0	2930	93 45 41	2919	95 17 36	2907
	Regulus	W.	54 34 14	2958	56 5 20	2946	57 36 41	2934	59 8 17	2921
	Antares	E.	46 5 12	2959	44 34 8	2950	43 2 52	2940	41 31 24	2930
	α Aquilæ	E.	94 41 49	3732	93 25 36	3718	92 9 8	3706	90 52 27	3693
17	Sun	W.	128 39 26	3188	130 5 49	3175	131 32 28	3161	132 59 24	3146
	Pollux	W.	103 1 0	2845	104 34 29	2833	106 8 14	2819	107 42 17	2805
	Regulus	W.	66 50 16	2857	68 23 30	2844	69 57 1	2830	71 30 50	2816
	Antares	E.	33 50 53	2880	32 18 8	2871	30 45 12	2862	29 12 5	2854
	α Aquilæ	E.	84 26 1	3643	83 8 13	3635	81 50 16	3628	80 32 12	3622
	Fomalhaut	E.	116 15 1	3049	114 45 49	3030	113 16 14	3013	111 46 17	2995
18	Pollux	W.	115 37 1	2736	117 12 53	2722	118 49 4	2707	120 25 34	2694
	Regulus	W.	79 24 30	2745	81 0 10	2730	82 36 10	2716	84 12 29	2701
	Spica	W.	25 39 35	2837	27 13 15	2811	28 47 28	2788	30 22 12	2765
	α Aquilæ	E.	74 0 36	3609	72 42 11	3609	71 23 46	3611	70 5 24	3616
	Fomalhaut	E.	104 11 1	2909	102 38 53	2891	101 6 23	2876	99 33 33	2859
19	Regulus	W.	92 19 0	2627	93 57 18	2613	95 35 55	2599	97 14 52	2585
	Spica	W.	38 22 55	2666	40 0 21	2647	41 38 12	2630	43 16 26	2613
	α Aquilæ	E.	63 35 27	3668	62 18 6	3687	61 1 5	3709	59 44 27	3732
	Fomalhaut	E.	91 44 14	2782	90 9 23	2767	88 34 12	2753	86 58 43	2739
	α Pegasi	E.	109 55 3	3074	108 26 22	3052	106 57 13	3029	105 27 36	3006
20	Regulus	W.	105 34 25	2516	107 15 16	2502	108 56 26	2489	110 37 54	2477
	Spica	W.	51 33 18	2533	53 13 46	2518	54 54 34	2503	56 35 43	2489
	α Aquilæ	E.	53 29 4	3990	52 16 5	3974	51 4 0	4036	49 52 56	4104
	Fomalhaut	E.	78 56 52	2677	77 19 41	2666	75 42 15	2655	74 4 35	2645
	α Pegasi	E.	97 53 12	2913	96 21 10	2897	94 48 47	2882	93 16 5	2867
21	Regulus	W.	119 9 34	2418	120 52 43	2408	122 36 7	2397	124 19 46	2387
	Spica	W.	65 6 17	2424	66 49 18	2411	68 32 37	2400	70 16 12	2388
	Fomalhaut	E.	65 53 10	2607	64 14 24	2601	62 35 30	2597	60 56 31	2593
	α Pegasi	E.	85 28 18	2809	83 54 2	2800	82 19 34	2792	80 44 56	2785
22	Spica	W.	78 58 0	2336	80 43 4	2330	82 28 20	2321	84 13 49	2313
	Antares	W.	33 5 19	2356	34 49 57	2344	36 34 53	2333	38 20 4	2322
	Fomalhaut	E.	52 41 5	2599	51 2 8	2604	49 23 18	2612	47 44 39	2622
	α Pegasi	E.	72 50 6	2770	71 14 59	2772	69 39 54	2774	68 4 52	2779

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
22	α Arietis	E.	121° 41′ 42″	2497	120° 0′ 24″	2482	118° 18′ 45″	2467	116° 36′ 46″	2454
23	Spica	W.	85 59 29	2306	87 45 20	2299	89 31 21	2292	91 17 32	2286
	Antares	W.	40 5 31	2313	41 51 12	2304	43 37 5	2296	45 23 10	2289
	Fomalhaut	E.	46 6 14	2635	44 28 7	2651	42 50 21	2670	41 13 1	2694
	α Pegasi	E.	66 29 56	2785	64 55 8	2792	63 20 29	2801	61 46 3	2813
	α Arietis	E.	108 2 31	2399	106 18 55	2390	104 35 6	2382	102 51 5	2373
24	Spica	W.	100 10 28	2262	101 57 23	2260	103 44 22	2256	105 31 26	2253
	Antares	W.	54 16 6	2259	56 3 6	2254	57 50 13	2251	59 37 25	2247
	α Pegasi	E.	53 58 48	2912	52 26 45	2942	50 55 19	2975	49 24 35	3014
	α Arietis	E.	94 8 29	2344	92 23 34	2341	90 38 34	2337	88 53 29	2335
	Aldebaran	E.	124 44 54	2272	122 58 14	2268	121 11 27	2263	119 24 33	2260
25	Spica	W.	114 27 30	2247	116 14 47	2248	118 2 3	2248	119 49 19	2249
	Antares	W.	68 34 33	2236	70 22 7	2235	72 9 42	2235	73 57 18	2234
	α Arietis	E.	80 7 21	2330	78 22 5	2331	76 36 50	2332	74 51 37	2333
	Aldebaran	E.	110 28 54	2247	108 41 36	2246	106 54 17	2245	105 6 56	2245
	Sun	E.	136 16 30	2527	134 35 54	2525	132 55 16	2525	131 14 38	2525
26	Antares	W.	82 55 13	2239	84 42 43	2241	86 30 10	2241	88 17 34	2245
	α Aquilæ	W.	45 44 59	4128	46 54 34	4019	48 5 55	3920	49 18 54	3832
	α Arietis	E.	66 6 29	2352	64 21 45	2358	62 37 10	2364	60 52 44	2372
	Aldebaran	E.	96 10 17	2249	94 23 2	2250	92 35 49	2253	90 48 40	2255
	Sun	E.	122 51 31	2530	121 10 59	2531	119 30 29	2533	117 50 2	2536
27	Antares	W.	97 13 35	2261	99 0 32	2264	100 47 24	2269	102 34 9	2273
	α Aquilæ	W.	55 43 55	3507	57 4 11	3462	58 25 18	3419	59 47 13	3382
	α Arietis	E.	52 13 35	2420	50 30 29	2433	48 47 42	2448	47 5 15	2463
	Aldebaran	E.	81 53 55	2271	80 7 13	2275	78 20 37	2279	76 34 7	2284
	Sun	E.	109 28 48	2552	107 48 47	2556	106 8 52	2561	104 29 3	2566
28	Antares	W.	111 26 13	2298	113 12 15	2303	114 58 10	2309	116 43 56	2315
	α Aquilæ	W.	66 46 11	3246	68 11 26	3226	69 37 4	3210	71 3 1	3197
	Fomalhaut	W.	31 39 42	2942	33 11 8	2889	34 43 41	2843	36 17 13	2804
	Aldebaran	E.	67 43 25	2310	65 57 40	2316	64 12 4	2322	62 26 36	2328
	Venus	E.	74 7 36	2674	72 30 21	2680	70 53 14	2685	69 16 14	2691
	Sun	E.	96 11 37	2591	94 32 29	2596	92 53 28	2601	91 14 35	2607
29	α Aquilæ	W.	78 16 7	3155	79 43 10	3152	81 10 17	3150	82 37 26	3150
	Fomalhaut	W.	44 15 24	2681	45 52 29	2666	47 29 54	2655	49 7 35	2645
	α Pegasi	W.	32 10 33	4227	33 18 34	4059	34 29 16	3914	35 42 22	3790
	Aldebaran	E.	53 41 39	2363	51 57 11	2370	50 12 53	2378	48 28 47	2386
	Venus	E.	61 13 18	2723	59 37 9	2729	58 1 8	2736	56 25 16	2744
	Sun	E.	83 2 11	2638	81 24 8	2645	79 46 14	2651	78 8 28	2658
30	α Aquilæ	W.	89 52 43	3168	91 19 30	3177	92 46 7	3185	94 12 34	3196
	Fomalhaut	W.	57 18 39	2617	58 57 11	2615	60 35 46	2614	62 14 22	2614
	α Pegasi	W.	42 15 26	3372	43 38 15	3316	45 2 8	3268	46 26 57	3225
	Aldebaran	E.	39 51 23	2433	38 8 36	2444	36 26 4	2456	34 43 49	2470
	Venus	E.	48 28 18	2779	46 53 23	2787	45 18 38	2794	43 44 2	2802
	Sun	E.	70 1 59	2693	68 25 10	2700	66 48 30	2707	65 12 0	2715

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
22	α Arietis	E.	114° 54′ 28″	2448	113° 11′ 53″	2430	111° 29′ 1″	2419	109° 45′ 53″	2409
23	Spica	W.	93 3 52	2281	94 50 20	2275	96 36 56	2270	98 23 39	2266
	Antares	W.	47 9 26	2280	48 55 52	2275	50 42 28	2269	52 29 13	2264
	Fomalhaut	E.	39 36 13	2722	38 0 2	2755	36 24 35	2795	34 50 0	2840
	α Pegasi	E.	60 11 52	2828	58 38 0	2845	57 4 30	2864	55 31 25	2886
	α Arietis	E.	101 6 52	2366	99 22 29	2360	97 37 57	2355	95 53 17	2349
24	Spica	W.	107 18 34	2251	109 5 45	2250	110 52 58	2249	112 40 13	2247
	Antares	W.	61 24 43	2243	63 12 6	2241	64 59 32	2239	66 47 1	2237
	α Pegasi	E.	47 54 39	3057	46 25 37	3105	44 57 34	3161	43 30 38	3225
	α Arietis	E.	87 8 20	2333	85 23 8	2331	83 37 53	2330	81 52 37	2330
	Aldebaran	E.	117 37 34	2256	115 50 30	2253	114 3 21	2251	112 16 9	2249
25	Spica	W.	121 36 33	2251	123 23 45	2253	125 10 54	2255	126 58 0	2258
	Antares	W.	75 44 55	2235	77 32 31	2235	79 20 7	2236	81 7 41	2237
	α Arietis	E.	73 6 26	2336	71 21 19	2339	69 36 17	2343	67 51 20	2347
	Aldebaran	E.	103 19 35	2245	101 32 14	2245	99 44 54	2246	97 57 35	2247
	Sun	E.	129 33 59	2595	127 53 20	2595	126 12 42	2597	124 32 6	2597
26	Antares	W.	90 4 55	2247	91 52 12	2251	93 39 24	2253	95 26 32	2257
	α Aquilæ	W.	50 33 23	3753	51 49 14	3681	53 6 21	3617	54 24 37	3560
	α Arietis	E.	59 8 29	2380	57 24 25	2389	55 40 34	2398	53 56 57	2409
	Aldebaran	E.	89 1 34	2258	87 14 32	2261	85 27 35	2264	83 40 42	2268
	Sun	E.	116 9 39	2538	114 29 19	2542	112 49 4	2545	111 8 54	2548
27	Antares	W.	104 20 48	2278	106 7 20	2283	107 53 45	2287	109 40 3	2293
	α Aquilæ	W.	61 9 50	3347	62 33 7	3318	63 56 58	3291	65 21 20	3266
	α Arietis	E.	45 23 10	2480	43 41 29	2499	42 0 15	2520	40 19 30	2543
	Aldebaran	E.	74 47 44	2289	73 1 28	2294	71 15 19	2299	69 29 18	2304
	Sun	E.	102 49 21	2570	101 9 45	2574	99 30 15	2580	97 50 52	2585
28	Antares	W.	118 29 34	2321	120 15 3	2327	122 0 23	2333	123 45 34	2339
	α Aquilæ	W.	72 29 14	3184	73 55 42	3175	75 22 21	3167	76 49 10	3160
	Fomalhaut	W.	37 51 36	2771	39 26 42	2749	41 2 26	2719	42 38 41	2698
	Aldebaran	E.	60 41 17	2335	58 56 8	2341	57 11 8	2348	55 26 18	2355
	Venus	E.	67 39 22	2697	66 2 38	2704	64 26 3	2710	62 49 36	2716
	Sun	E.	89 35 49	2613	87 57 12	2619	86 18 43	2626	84 40 23	2632
29	α Aquilæ	W.	84 4 35	3151	85 31 43	3153	86 58 48	3157	88 25 49	3163
	Fomalhaut	W.	50 45 29	2637	52 23 34	2628	54 1 49	2624	55 40 11	2620
	α Pegasi	W.	36 57 35	3681	38 14 42	3587	39 33 30	3506	40 53 48	3434
	Aldebaran	E.	46 44 52	2395	45 1 10	2404	43 17 41	2413	41 34 25	2423
	Venus	E.	54 49 34	2750	53 14 1	2757	51 38 37	2765	50 3 23	2772
	Sun	E.	76 30 52	2665	74 53 25	2672	73 16 7	2678	71 38 58	2686
30	α Aquilæ	W.	95 38 48	3207	97 4 49	3220	98 30 34	3234	99 56 3	3250
	Fomalhaut	W.	63 52 58	2614	65 31 34	2615	67 10 8	2618	68 48 39	2620
	α Pegasi	W.	47 52 36	3188	49 19 0	3155	50 46 3	3126	52 13 41	3101
	Aldebaran	E.	33 1 53	2463	31 20 16	2498	29 39 0	2515	27 58 7	2532
	Venus	E.	42 9 37	2810	40 35 22	2818	39 1 18	2826	37 27 24	2835
	Sun	E.	63 35 40	2722	61 59 30	2730	60 23 30	2738	58 47 41	2746

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	6 40 33.06	10.343	N.23 7 36.8	−10.01	15 46.12	68.79	3 31.97	0.485
Thur.	2	6 44 41.18	10.333	23 3 24.3	11.02	15 46.11	68.75	3 43.50	0.475
Frid.	3	6 48 49.05	10.322	22 58 47.6	12.02	15 46.10	68.71	3 54.78	0.464
Sat.	4	6 52 56.63	10.309	22 53 46.9	−13.02	15 46.10	68.67	4 5.78	0.451
SUN.	5	6 57 3.91	10 296	22 48 22.2	14.02	15 46.11	68.62	4 16.47	0.438
Mon.	6	7 1 10.86	10.282	22 42 33.7	15.01	15 46.12	68.57	4 26.83	0.424
Tues.	7	7 5 17.45	10 267	22 36 21.5	−16.00	15 46.13	68.52	4 36.84	0.409
Wed.	8	7 9 23.67	10.251	22 29 45.8	16.97	15 46.16	68.47	4 46.47	0.393
Thur.	9	7 13 29.48	10.234	22 22 46.7	17.94	15 46.19	68.41	4 55.70	0.376
Frid.	10	7 17 34.88	10.216	22 15 24.4	−18.90	15 46.22	68.35	5 4.51	0.358
Sat.	11	7 21 39.83	10.197	22 7 39.1	19.85	15 46.26	68.29	5 12.88	0.339
SUN.	12	7 25 44.32	10.177	21 59 30.9	20.79	15 46 30	68.23	5 20.80	0.319
Mon.	13	7 29 48.34	10.157	21 51 0.0	−21.73	15 46.35	68.16	5 28.24	0.299
Tues.	14	7 33 51.86	10.136	21 42 6.7	22.66	15 46.40	68.10	5 35.18	0.278
Wed.	15	7 37 54.88	10.115	21 32 51.3	23.58	15 46.46	68.03	5 41.62	0.257
Thur.	16	7 41 57.38	10.093	21 23 13.9	−24.50	15 46.52	67.96	5 47.54	0.235
Frid.	17	7 45 59.35	10.071	21 13 14.8	25.41	15 46.59	67.89	5 52.94	0.213
Sat.	18	7 50 0.78	10.048	21 2 54.1	26.30	15 46.66	67.82	5 57.80	0.191
SUN.	19	7 54 1.66	10.025	20 52 12.1	−27.19	15 46.73	67.74	6 2.11	0.168
Mon.	20	7 58 1.98	10.002	20 41 9.0	28.06	15 46.81	67.66	6 5.87	0.145
Tues.	21	8 2 1.75	9.979	20 29 45.1	28.92	15 46.89	67.58	6 9.07	0.122
Wed.	22	8 6 0.96	9.955	20 18 0.6	−29.78	15 46.97	67.50	6 11.71	0.098
Thur.	23	8 9 59.60	9.931	20 5 55.7	30.62	15 47.05	67.42	6 13.79	0.074
Frid.	24	8 13 57 67	9.908	19 53 30.6	31.45	15 47.14	67.34	6 15.31	0.051
Sat.	25	8 17 55.16	9.884	19 40 45.7	−32.27	15 47.23	67.25	6 16.25	0.027
SUN.	26	8 21 52.08	9.860	19 27 41.2	33.08	15 47.32	67.17	6 16.61	0.003
Mon.	27	8 25 48.43	9.836	19 14 17.3	33.88	15 47.42	67.08	6 16.40	0.021
Tues.	28	8 29 44.20	9.812	19 0 34.2	−34.68	15 47.52	67.00	6 15.62	0.045
Wed.	29	8 33 39.39	9.788	18 46 32.2	35.46	15 47.63	66.91	6 14.26	0.069
Thur.	30	8 37 34.00	9.764	18 32 11.7	36.23	15 47.74	66.82	6 12.31	0.093
Frid.	31	8 41 28.01	9.739	18 17 32.8	36.99	15 47.85	66.73	6 9.76	0.118
Sat.	32	8 45 21.43	9.714	N.18 2 35.9	−37.74	15 47.97	66.64	6 6.63	0.143

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.19 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	6 40 32.45	10.342	N. 23 7 37.4	−10.01	3 31.94	0.485	6 37 0.51
Thur.	2	6 44 40.54	10.332	23 3 25.0	11.02	3 43.47	0.475	6 40 57.07
Frid.	3	6 48 48.38	10.321	22 58 48.4	12.02	3 54.75	0.464	6 44 53.63
Sat.	4	6 52 55.93	10.308	22 53 47.8	−13.03	4 5.75	0.451	6 48 50.18
SUN.	5	6 57 3.18	10.295	22 48 23.2	14.02	4 16.44	0.438	6 52 46.74
Mon.	6	7 1 10.10	10.281	22 42 34.8	15.01	4 26.80	0.424	6 56 43.30
Tues.	7	7 5 16.67	10.266	22 36 22.7	−16.00	4 36.81	0.409	7 0 39.86
Wed.	8	7 9 22.86	10.250	22 29 47.1	16.97	4 46.44	0.393	7 4 36.42
Thur.	9	7 13 28.65	10.233	22 22 48.1	17.94	4 55.67	0.376	7 8 32.98
Frid.	10	7 17 34.02	10.215	22 15 25.9	−18.90	5 4.48	0.358	7 12 29.54
Sat.	11	7 21 38.95	10.196	22 7 40.7	19.85	5 12.85	0.339	7 16 26.10
SUN.	12	7 25 43.42	10.176	21 59 32.7	20.79	5 20.77	0.319	7 20 22.65
Mon.	13	7 29 47.42	10.156	21 51 2.0	−21.73	5 28.21	0.299	7 24 19.21
Tues.	14	7 33 50.92	10.135	21 42 8.9	22.66	5 35.15	0.278	7 28 15.77
Wed.	15	7 37 53.92	10.114	21 32 53.6	23.58	5 41.59	0.257	7 32 12.33
Thur.	16	7 41 56.40	10.092	21 23 16.4	−24.50	5 47.52	0.235	7 36 8.88
Frid.	17	7 45 58.36	10.070	21 13 17.4	25.41	5 52.92	0.213	7 40 5.44
Sat.	18	7 49 59.78	10.048	21 2 56.8	26.30	5 57.78	0.191	7 44 2.00
SUN.	19	7 54 0 65	10.025	20 52 14.9	−27.19	6 2.10	0.168	7 47 58.55
Mon.	20	7 58 0.97	10.002	20 41 11.9	28.06	6 5.86	0.145	7 51 55.11
Tues.	21	8 2 0.73	9.978	20 29 48.1	28.92	6 9.06	0.122	7 55 51.67
Wed.	22	8 5 59.93	9.955	20 18 3.7	−29.78	6 11.70	0.098	7 59 48.23
Thur.	23	8 9 58.57	9.931	20 5 58.9	30.62	6 13.78	0.074	8 3 44.79
Frid.	24	8 13 56.64	9.908	19 53 33.9	31.45	6 15.30	0.051	8 7 41.34
Sat.	25	8 17 54.14	9.884	19 40 49.1	−32.27	6 16.24	0.027	8 11 37.90
SUN.	26	8 21 51.06	9.860	19 27 44.7	33.08	6 16.60	0.003	8 15 34.46
Mon.	27	8 25 47.41	9.836	19 14 20.8	33.88	6 16.40	0.021	8 19 31.01
Tues.	28	8 29 43.19	9.812	19 0 37.8	−34.68	6 15.62	0.045	8 23 27.57
Wed.	29	8 33 38.38	9.788	18 46 35.9	35.46	6 14.26	0.069	8 27 24.12
Thur.	30	8 37 32.99	9.764	18 32 15.4	36.23	6 12.31	0.093	8 31 20.68
Frid.	31	8 41 27.01	9.739	18 17 36.6	36.99	6 9.77	0.118	8 35 17.24
Sat.	32	8 45 20.44	9.714	N. 18 2 39.7	−37.74	6 6.64	0.143	8 39 13.80

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	182	99 19 7.4	18 57.4	143.02	− 0.10	0.0072289	+ 2.6	17 20 8.62
2	183	100 16 19.9	16 9.7	143.02	+ 0.02	0.0072341	1.6	17 16 12.70
3	184	101 13 32.6	13 22.2	143.03	0.15	0.0072369	+ 0.6	17 12 16.79
4	185	102 10 45.5	10 34.9	143.03	+ 0.29	0.0072372	− 0.4	17 8 20.88
5	186	103 7 58.5	7 47.8	143.03	0.41	0.0072349	1.5	17 4 24.97
6	187	104 5 11.6	5 0.7	143.03	0.51	0.0072299	2.6	17 0 29.06
7	188	105 2 24.9	2 13.8	143.04	+ 0.60	0.0072222	− 3.7	16 56 33.15
8	189	105 59 38.2	59 26.9	143.05	0.67	0.0072119	4.8	16 52 37.24
9	190	106 56 51.6	56 40.1	143.06	0.70	0.0071990	5.9	16 48 41.32
10	191	107 54 5.1	53 53.4	143.06	+ 0.70	0.0071836	− 6.9	16 44 45.40
11	192	108 51 18.6	51 6.7	143.06	0.67	0.0071657	7.9	16 40 49.49
12	193	109 48 32.0	48 20.0	143.06	0.62	0.0071455	8.9	16 36 53.58
13	194	110 45 45.4	45 33.3	143.06	+ 0.54	0.0071231	− 9.8	16 32 57.67
14	195	111 42 58.9	42 46.6	143.06	0.44	0.0070985	10.7	16 29 1.75
15	196	112 40 12.6	40 0.0	143.07	0.31	0.0070719	11.5	16 25 5.84
16	197	113 37 26.3	37 13.5	143.07	+ 0.18	0.0070436	−12.2	16 21 9.93
17	198	114 34 40.2	34 27.2	143.08	+ 0.05	0.0070136	12.8	16 17 14.02
18	199	115 31 54.4	31 41.2	143.10	− 0.08	0.0069821	13.5	16 13 18.12
19	200	116 29 9.0	28 55.7	143.12	− 0.21	0.0069491	−14.1	16 9 22.21
20	201	117 26 24.0	26 10.5	143.13	0.32	0.0069147	14.7	16 5 26.30
21	202	118 23 39.4	23 25.7	143.15	0.40	0.0068789	15.2	16 1 30.39
22	203	119 20 55.3	20 41.4	143.18	− 0.45	0.0068417	−15.8	15 57 34.47
23	204	120 18 11.9	17 57.9	143.21	0.48	0.0068031	16.4	15 53 38.56
24	205	121 15 29.4	15 15.2	143.24	0.48	0.0067631	17.0	15 49 42.65
25	206	122 12 47.7	12 33.4	143.28	− 0.45	0.0067217	−17.6	15 45 46.74
26	207	123 10 6.9	9 52.4	143.32	0.39	0.0066788	18.2	15 41 50.82
27	208	124 7 27.1	7 12.4	143.36	0.30	0.0066343	18.9	15 37 54.91
28	209	125 4 48.4	4 33.6	143.40	− 0.19	0.0065880	−19.7	15 33 59.00
29	210	126 2 10.8	1 55.9	143.45	− 0.07	0.0065398	20.5	15 30 3.09
30	211	126 59 34.3	59 19.2	143.49	+ 0.06	0.0064896	21.3	15 26 7.18
31	212	127 56 58.8	56 43.5	143.54	0.19	0.0064373	22.2	15 22 11.27
32	213	128 54 24.4	54 8.9	143.59	+ 0.31	0.0063828	−23.1	15 18 15.36
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.								Diff. for 1 Hour, — $9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 54.3	15 50.7	58 15.8	−1.07	58 2.7	−1.11	20 46.7	2.15	24.8
2	15 47.0	15 43.2	57 49.1	1.16	57 35.0	1.20	21 39.4	2.23	25.8
3	15 39.3	15 35.2	57 20.4	1.24	57 5.4	1.27	22 33.9	2.29	26.8
4	15 31.0	15 26.8	56 50.1	−1.29	56 34.6	−1.30	23 29.4	2.30	27.8
5	15 22.5	15 18.3	56 19.0	1.30	56 3.4	1.29	6		28.8
6	15 14.1	15 10.0	55 48.0	1.27	55 33.1	1.23	0 24.3	2.24	0.3
7	15 6.1	15 2.4	55 18.7	−1.17	55 5.1	−1.10	1 17.1	2.13	1.3
8	14 59.0	14 55.9	54 52.5	1.00	54 41.1	0.90	2 6.8	2.00	2.3
9	14 53.1	14 50.9	54 31.1	0.77	54 22.8	0.62	2 53.3	1.87	3.3
10	14 49.1	14 47.9	54 16.3	−0.46	54 11.8	−0.29	3 36.8	1.77	4.3
11	14 47.3	14 47.2	54 9.5	−0.11	54 9.4	+0.10	4 18.1	1.69	5.3
12	14 47.9	14 49.2	54 11.8	+0.30	54 16.6	0.51	4 58.1	1.66	6.3
13	14 51.2	14 53.9	54 24.0	+0.73	54 34.0	+0.94	5 38.0	1.68	7.3
14	14 57.3	15 1.4	54 46.5	1.15	55 1.4	1.35	6 18.7	1.74	8.3
15	15 6.1	15 11.3	55 18.7	1.54	55 38.1	1.70	7 1.6	1.86	9.3
16	15 17.2	15 23.5	55 59.5	+1.86	56 22.6	+1.98	7 47.8	2.01	10.3
17	15 30.1	15 37.0	56 47.0	2.08	57 12.3	2.14	8 38.1	2.20	11.3
18	15 44.1	15 51.0	57 38.1	2.16	58 3.8	2.13	9 33.2	2.38	12.3
19	15 57.9	16 4.4	58 29.0	+2.05	58 53.0	+1.94	10 32.5	2.52	13.3
20	16 10.5	16 16.0	59 15.4	1.77	59 35.5	1.56	11 34.3	2.58	14.3
21	16 20.7	16 24.6	59 52.8	1.32	60 6.9	1.04	12 36.1	2.53	15.3
22	16 27.5	16 29.4	60 17.6	+0.75	60 24.7	+0.44	13 35.8	2.41	16.3
23	16 30.3	16 30.2	60 27.9	+0.13	60 27.6	−0.18	14 32.1	2.28	17.3
24	16 29.1	16 27.2	60 23.7	−0.46	60 16.6	0.72	15 25.1	2.16	18.3
25	16 24.5	16 21.1	60 6.5	−0.94	59 54.1	−1.13	16 15.6	2.07	19.3
26	16 17.1	16 12.7	59 39.6	1.28	59 23.4	1.40	17 4.7	2.04	20.3
27	16 8.0	16 3.1	59 6.0	1.48	58 47.9	1.54	17 53.8	2.06	21.3
28	15 58.0	15 52.8	58 29.3	−1.57	58 10.4	−1.57	18 43.8	2.12	22.3
29	15 47.8	15 42.7	57 51.7	1.56	57 33.1	1.54	19 35.5	2.19	23.3
30	15 37.8	15 33.0	57 15.0	1.49	56 57.4	1.45	20 28.9	2.25	24.3
31	15 28.3	15 23.9	56 40.4	1.40	56 24.0	1.35	21 23.4	2.27	25.3
32	15 19.6	15 15.5	56 8.2	−1.29	55 53.1	−1.24	22 17.8	2.24	26.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 41 19.23	2.1736	N.13 33 17.9	13.106
1	2 43 29.73	2.1764	13 46 21.9	13.027
2	2 45 40.40	2.1792	13 59 21.2	12.948
3	2 47 51.24	2.1822	14 12 15.7	12.868
4	2 50 2.26	2.1852	14 25 5.3	12.786
5	2 52 13.46	2.1882	14 37 50.0	12.703
6	2 54 24.84	2.1912	14 50 29.6	12.618
7	2 56 36.40	2.1942	15 3 4.1	12.533
8	2 58 48.15	2.1973	15 15 33.5	12.446
9	3 1 0.08	2.2004	15 27 57.6	12.358
10	3 3 12.20	2.2036	15 40 16.4	12.269
11	3 5 24.51	2.2068	15 52 29.9	12.179
12	3 7 37.02	2.2101	16 4 37.9	12.087
13	3 9 49.72	2.2133	16 16 40.3	11.994
14	3 12 2.62	2.2166	16 28 37.1	11.900
15	3 14 15.71	2.2198	16 40 28.3	11.806
16	3 16 29.00	2.2231	16 52 13.8	11.710
17	3 18 42.49	2.2264	17 3 53.5	11.612
18	3 20 56.17	2.2298	17 15 27.3	11.513
19	3 23 10.06	2.2332	17 26 55.1	11.413
20	3 25 24.15	2.2365	17 38 16.9	11.313
21	3 27 38.44	2.2399	17 49 32.7	11.212
22	3 29 52.94	2.2433	18 0 42.4	11.109
23	3 32 7.64	2.2467	N.18 11 45.8	11.004

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 34 22.55	2.2502	N.18 22 42.9	10.898
1	3 36 37.66	2.2536	18 33 33.6	10.792
2	3 38 52.98	2.2570	18 44 18.0	10.686
3	3 41 8.50	2.2604	18 54 55.9	10.577
4	3 43 24.23	2.2638	19 5 27.2	10.467
5	3 45 40.16	2.2672	19 15 51.9	10.357
6	3 47 56.29	2.2706	19 26 10.0	10.245
7	3 50 12.63	2.2740	19 36 21.3	10.132
8	3 52 29.17	2.2774	19 46 25.8	10.018
9	3 54 45.92	2.2808	19 56 23.5	9.903
10	3 57 2.87	2.2841	20 6 14.2	9.767
11	3 59 20.01	2.2874	20 15 57.0	9.670
12	4 1 37.36	2.2908	20 25 34.6	9.552
13	4 3 54.91	2.2942	20 35 4.2	9.433
14	4 6 12.66	2.2974	20 44 26.6	9.313
15	4 8 30.60	2.3007	20 53 41.8	9.193
16	4 10 48.74	2.3039	21 2 49.7	9.071
17	4 13 7.07	2.3072	21 11 50.3	8.947
18	4 15 25.60	2.3104	21 20 43.4	8.823
19	4 17 44.32	2.3135	21 29 29.1	8.699
20	4 20 3.22	2.3166	21 38 7.3	8.574
21	4 22 22.31	2.3197	21 46 38.0	8.447
22	4 24 41.58	2.3227	21 55 1.0	8.320
23	4 27 1.04	2.3258	22 3 16.4	8.192
24	4 29 20.68	2.3288	N.22 11 24.0	8.062

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 29 20.68	2.3288	N.22 11 24.0	8.062
1	4 31 40.50	2.3317	22 19 23.8	7.932
2	4 34 0.49	2.3346	22 27 15.8	7.802
3	4 36 20.65	2.3374	22 35 0.0	7.670
4	4 38 40.98	2.3402	22 42 36.2	7.538
5	4 41 1.47	2.3429	22 50 4.5	7.405
6	4 43 22.13	2.3456	22 57 24.8	7.271
7	4 45 42.95	2.3482	23 4 37.0	7.136
8	4 48 3.92	2.3508	23 11 41.1	7.000
9	4 50 25.05	2.3533	23 18 37.0	6.863
10	4 52 46.32	2.3558	23 25 24.7	6.726
11	4 55 7.74	2.3582	23 32 4.2	6.589
12	4 57 29.30	2.3605	23 38 35.4	6.451
13	4 59 51.00	2.3627	23 44 58.3	6.312
14	5 2 12.83	2.3649	23 51 12.8	6.172
15	5 4 34.79	2.3670	23 57 19.0	6.032
16	5 6 56.87	2.3690	24 3 16.7	5.892
17	5 9 19.07	2.3710	24 9 6.0	5.751
18	5 11 41.39	2.3729	24 14 46.8	5.609
19	5 14 3.82	2.3747	24 20 19.0	5.466
20	5 16 26.36	2.3764	24 25 42.7	5.323
21	5 18 48.99	2.3780	24 30 57.8	5.180
22	5 21 11.72	2.3796	24 36 4.3	5.036
23	5 23 34.55	2.3812	N.24 41 2.1	4.892

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 25 57.47	2.3827	N.24 45 51.3	4.747
1	5 28 20.47	2.3839	24 50 31.8	4.602
2	5 30 43.54	2.3851	24 55 3.5	4.456
3	5 33 6.68	2.3862	24 59 26.5	4.310
4	5 35 29.89	2.3873	25 3 40.7	4.164
5	5 37 53.16	2.3882	25 7 46.2	4.018
6	5 40 16.48	2.3891	25 11 42.9	3.871
7	5 42 39.85	2.3899	25 15 30.7	3.724
8	5 45 3.27	2.3907	25 19 9.7	3.577
9	5 47 26.73	2.3912	25 22 39.9	3.430
10	5 49 50.22	2.3917	25 26 1.3	3.282
11	5 52 13.73	2.3920	25 29 13.7	3.133
12	5 54 37.26	2.3923	25 32 17.2	2.985
13	5 57 0.80	2.3925	25 35 11.9	2.837
14	5 59 24.36	2.3927	25 37 57.7	2.688
15	6 1 47.92	2.3926	25 40 34.5	2.539
16	6 4 11.47	2.3925	25 43 2.4	2.392
17	6 6 35.02	2.3923	25 45 21.5	2.244
18	6 8 58.55	2.3920	25 47 31.7	2.096
19	6 11 22.06	2.3916	25 49 33.0	1.947
20	6 13 45.54	2.3911	25 51 25.3	1.798
21	6 16 8.99	2.3905	25 53 8.7	1.650
22	6 18 32.40	2.3897	25 54 43.3	1.502
23	6 20 55.76	2.3888	25 56 8.9	1.353
24	6 23 19.06	2.3879	N.25 57 25.6	1.204

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 23 19.06	2.3879	N.25 57 25.6	1.204
1	6 25 42.31	2.3879	25 58 33.4	1.056
2	6 28 5.50	2.3858	25 59 32.4	0.909
3	6 30 28.61	2.3846	26 0 22.5	0.762
4	6 32 51.65	2.3833	26 1 3.8	0.614
5	6 35 14.61	2.3818	26 1 36.2	0.467
6	6 37 37.47	2.3803	26 1 59.8	0.320
7	6 40 0.24	2.3787	26 2 14.6	0.173
8	6 42 22.91	2.3769	26 2 20.6	+ 0.027
9	6 44 45.47	2.3751	26 2 17.8	− 0.119
10	6 47 7.92	2.3732	26 2 6.3	0.264
11	6 49 30.25	2.3712	26 1 46.1	0.410
12	6 51 52.46	2.3691	26 1 17.1	0.556
13	6 54 14.54	2.3668	26 0 39.4	0.700
14	6 56 36.48	2.3644	25 59 53.1	0.843
15	6 58 58.27	2.3619	25 58 58.2	0.987
16	7 1 19.91	2.3594	25 57 54.7	1.130
17	7 3 41.40	2.3569	25 56 42.6	1.272
18	7 6 2.74	2.3542	25 55 22.0	1.414
19	7 8 23.91	2.3514	25 53 52.9	1.556
20	7 10 44.91	2.3485	25 52 15.3	1.697
21	7 13 5.73	2.3455	25 50 29.2	1.838
22	7 15 26.37	2.3425	25 48 34.7	1.978
23	7 17 46.83	2.3394	N.25 46 31.9	2.117

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 20 7.10	2.3362	N.25 44 20.7	2.256
1	7 22 27.17	2.3328	25 42 1.2	2.394
2	7 24 47.04	2.3294	25 39 33.5	2.531
3	7 27 6.70	2.3259	25 36 57.5	2.668
4	7 29 26.15	2.3223	25 34 13.3	2.804
5	7 31 45.38	2.3187	25 31 21.0	2.938
6	7 34 4.39	2.3150	25 28 20.7	3.072
7	7 36 23.18	2.3112	25 25 12.3	3.206
8	7 38 41.74	2.3073	25 21 55.9	3.340
9	7 41 0.06	2.3034	25 18 31.5	3.472
10	7 43 18.15	2.2995	25 14 59.2	3.603
11	7 45 36.00	2.2954	25 11 19.1	3.733
12	7 47 53.60	2.2913	25 7 31.2	3.863
13	7 50 10.95	2.2871	25 3 35.5	3.992
14	7 52 28.05	2.2828	24 59 32.1	4.121
15	7 54 44.89	2.2785	24 55 21.0	4.248
16	7 57 1.47	2.2741	24 51 2.3	4.375
17	7 59 17.78	2.2696	24 46 36.0	4.500
18	8 1 33.82	2.2651	24 42 2.3	4.624
19	8 3 49.59	2.2606	24 37 21.1	4.748
20	8 6 5.09	2.2560	24 32 32.5	4.872
21	8 8 20.31	2.2513	24 27 36.5	4.994
22	8 10 35.25	2.2467	24 22 33.2	5.115
23	8 12 49.91	2.2419	24 17 22.7	5.235
24	8 15 4.28	2.2371	N.24 12 5.0	5.354

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 15 4.28	2.2371	N.24 12 5.0	5.354
1	8 17 18.36	2.2322	24 6 40.2	5.472
2	8 19 32.15	2.2274	24 1 8.3	5.590
3	8 21 45.65	2.2225	23 55 29.4	5.706
4	8 23 58.85	2.2176	23 49 43.6	5.821
5	8 26 11.76	2.2127	23 43 50.9	5.936
6	8 28 24.37	2.2076	23 37 51.3	6.050
7	8 30 36.67	2.2025	23 31 44.9	6.162
8	8 32 48.67	2.1975	23 25 31.8	6.273
9	8 35 0.37	2.1924	23 19 12.1	6.383
10	8 37 11.76	2.1872	23 12 45.8	6.493
11	8 39 22.84	2.1821	23 6 12.9	6.602
12	8 41 33.61	2.1769	22 59 33.6	6.708
13	8 43 44.07	2.1718	22 52 47.9	6.815
14	8 45 54.22	2.1666	22 45 55.8	6.922
15	8 48 4.06	2.1613	22 38 57.3	7.027
16	8 50 13.58	2.1561	22 31 52.6	7.130
17	8 52 22.79	2.1509	22 24 41.7	7.232
18	8 54 31.69	2.1456	22 17 24.8	7.333
19	8 56 40.27	2.1403	22 10 1.8	7.433
20	8 58 48.53	2.1351	22 2 32.8	7.532
21	9 0 56.48	2.1298	21 54 57.9	7.631
22	9 3 4.11	2.1245	21 47 17.1	7.728
23	9 5 11.42	2.1192	N.21 39 30.5	7.825

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 7 18.42	2.1140	N.21 31 38.1	7.921
1	9 9 25.10	2.1087	21 23 40.0	8.014
2	9 11 31.46	2.1034	21 15 36.4	8.107
3	9 13 37.51	2.0982	21 7 27.2	8.199
4	9 15 43.24	2.0929	20 59 12.5	8.291
5	9 17 48.66	2.0877	20 50 52.3	8.382
6	9 19 53.77	2.0825	20 42 26.7	8.471
7	9 21 58.56	2.0772	20 33 55.8	8.558
8	9 24 3.04	2.0720	20 25 19.7	8.645
9	9 26 7.20	2.0668	20 16 38.4	8.732
10	9 28 11.05	2.0616	20 7 51.9	8.817
11	9 30 14.59	2.0564	19 59 0.4	8.900
12	9 32 17.82	2.0512	19 50 3.9	8.983
13	9 34 20.74	2.0461	19 41 2.4	9.066
14	9 36 23.35	2.0410	19 31 56.0	9.147
15	9 38 25.66	2.0359	19 22 44.8	9.227
16	9 40 27.66	2.0308	19 13 28.8	9.306
17	9 4. 29.36	2.0258	19 4 8.1	9.384
18	9 44 30.76	2.0208	18 54 42.7	9.462
19	9 46 31.86	2.0158	18 45 12.7	9.538
20	9 48 32.66	2.0108	18 35 38.2	9.613
21	9 50 33.16	2.0059	18 25 59.2	9.688
22	9 52 33.37	2.0011	18 16 15.7	9.761
23	9 54 33.29	1.9962	18 6 27.9	9.832
24	9 56 32.91	1.9913	N.17 56 35.8	9.903

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 56 32.91	1.9913	N.17 56 35.8	9.903
1	9 58 32.24	1.9865	17 46 39.5	9.974
2	10 0 31.29	1.9818	17 36 38.9	10.044
3	10 2 30.06	1.9771	17 26 34.2	10.112
4	10 4 28.54	1.9724	17 16 25.4	10.180
5	10 6 26.74	1.9678	17 6 12.6	10.246
6	10 8 24.67	1.9632	16 55 55.9	10.312
7	10 10 22.32	1.9586	16 45 35.2	10.377
8	10 12 19.70	1.9540	16 35 10.7	10.440
9	10 14 16.80	1.9495	16 24 42.4	10.503
10	10 16 13.64	1.9451	16 14 10.3	10.566
11	10 18 10.21	1.9407	16 3 34.5	10.627
12	10 20 6.52	1.9363	15 52 55.1	10.687
13	10 22 2.57	1.9320	15 42 12.1	10.746
14	10 23 58.36	1.9278	15 31 25.6	10.805
15	10 25 53.90	1.9236	15 20 35.5	10.863
16	10 27 49.19	1.9194	15 9 42.0	10.919
17	10 29 44.23	1.9152	14 58 45.2	10.975
18	10 31 39.02	1.9112	14 47 45.0	11.031
19	10 33 33.57	1.9072	14 36 41.5	11.085
20	10 35 27.88	1.9032	14 25 34.8	11.138
21	10 37 21.96	1.8993	14 14 24.9	11.191
22	10 39 15.80	1.8954	14 3 11.9	11.242
23	10 41 9.41	1.8916	N.13 51 55.9	11.292

FRIDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 43 2.80	1.8879	N.13 40 36.9	11.342
1	10 44 55.96	1.8842	13 29 14.9	11.392
2	10 46 48.90	1.8805	13 17 49.9	11.441
3	10 48 41.62	1.8769	13 6 22.0	11.488
4	10 50 34.13	1.8734	12 54 51.3	11.535
5	10 52 26.43	1.8699	12 43 17.8	11.581
6	10 54 18.52	1.8665	12 31 41.6	11.626
7	10 56 10.41	1.8632	12 20 2.7	11.670
8	10 58 2.10	1.8598	12 8 21.2	11.714
9	10 59 53.59	1.8566	11 56 37.0	11.757
10	11 1 44.89	1.8534	11 44 50.3	11.799
11	11 3 36.00	1.8502	11 33 1.1	11.841
12	11 5 26.92	1.8472	11 21 9.4	11.882
13	11 7 17.66	1.8442	11 9 15.3	11.921
14	11 9 8.22	1.8412	10 57 18.9	11.960
15	11 10 58.61	1.8383	10 45 20.1	11.999
16	11 12 48.82	1.8355	10 33 19.0	12.037
17	11 14 38.87	1.8327	10 21 15.7	12.074
18	11 16 28.75	1.8300	10 9 10.2	12.110
19	11 18 18.47	1.8274	9 57 2.5	12.145
20	11 20 8.04	1.8248	9 44 52.8	12.179
21	11 21 57.45	1.8222	9 32 41.0	12.213
22	11 23 46.71	1.8198	9 20 27.2	12.247
23	11 25 35.83	1.8174	9 8 11.4	12.279
24	11 27 24.80	1.8151	N. 8 55 53.7	12.311

SATURDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 27 24.80	1.8151	N. 8 55 53.7	12.311
1	11 29 13.64	1.8128	8 43 34.1	12.342
2	11 31 2.34	1.8106	8 31 12.6	12.373
3	11 32 50.91	1.8085	8 18 49.3	12.403
4	11 34 39.36	1.8065	8 6 24.3	12.432
5	11 36 27.69	1.8045	7 53 57.5	12.461
6	11 38 15.90	1.8025	7 41 29.0	12.488
7	11 40 3.99	1.8007	7 28 58.9	12.515
8	11 41 51.98	1.7989	7 16 27.2	12.542
9	11 43 39.86	1.7972	7 3 53.9	12.567
10	11 45 27.64	1.7955	6 51 19.1	12.592
11	11 47 15.32	1.7938	6 38 42.8	12.617
12	11 49 2.90	1.7922	6 26 5.0	12.641
13	11 50 50.39	1.7908	6 13 25.9	12.664
14	11 52 37.80	1.7895	6 0 45.4	12.687
15	11 54 25.13	1.7882	5 48 3.5	12.709
16	11 56 12.38	1.7869	5 35 20.3	12.730
17	11 57 59.56	1.7858	5 22 35.9	12.750
18	11 59 46.67	1.7847	5 9 50.3	12.770
19	12 1 33.72	1.7836	4 57 3.5	12.789
20	12 3 20.70	1.7825	4 44 15.6	12.808
21	12 5 7.62	1.7816	4 31 26.5	12.827
22	12 6 54.49	1.7807	4 18 36.4	12.843
23	12 8 41.31	1.7799	N. 4 5 45.3	12.859

SUNDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 10 28.08	1.7792	N. 3 52 53.3	12.875
1	12 12 14.81	1.7786	3 40 0.3	12.891
2	12 14 1.51	1.7781	3 27 6.3	12.907
3	12 15 48.18	1.7776	3 14 11.5	12.921
4	12 17 34.82	1.7772	3 1 15.8	12.934
5	12 19 21.44	1.7768	2 48 19.4	12.947
6	12 21 8.04	1.7765	2 35 22.2	12.959
7	12 22 54.62	1.7763	2 22 24.3	12.971
8	12 24 41.19	1.7762	2 9 25.7	12.982
9	12 26 27.76	1.7761	1 56 26.4	12.993
10	12 28 14.32	1.7761	1 43 26.5	13.003
11	12 30 0.89	1.7762	1 30 26.0	13.012
12	12 31 47.46	1.7763	1 17 25.0	13.021
13	12 33 34.04	1.7765	1 4 23.5	13.029
14	12 35 20.64	1.7768	0 51 21.5	13.037
15	12 37 7.26	1.7772	0 38 19.1	13.043
16	12 38 53.90	1.7776	0 25 16.3	13.049
17	12 40 40.57	1.7781	N. 0 12 13.2	13.054
18	12 42 27.28	1.7787	S. 0 0 50.2	13.059
19	12 44 14.02	1.7793	0 13 53.9	13.063
20	12 46 0.80	1.7801	0 26 57.8	13.067
21	12 47 47.63	1.7809	0 40 1.9	13.070
22	12 49 34.51	1.7818	0 53 6.2	13.072
23	12 51 21.45	1.7827	1 6 10.6	13.074
24	12 53 8.44	1.7838	S. 1 19 15.1	13.075

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 53 8.44	1.7838	S. 1 19 15.1	13.075
1	12 54 55.50	1.7849	1 32 19.6	13.075
2	12 56 42.63	1.7860	1 45 24.1	13.075
3	12 58 29.82	1.7872	1 58 28.6	13.074
4	13 0 17.09	1.7886	2 11 33.0	13.073
5	·13 2 4.45	1.7900	2 24 37.3	13.071
6	13 3 51.89	1.7914	2 37 41.5	13.068
7	13 5 39.42	1.7930	2 50 45.5	13.064
8	13 7 27.05	1.7946	3 3 49.2	13.060
9	13 9 14.77	1.7963	3 16 52.7	13.056
10	13 11 2.60	1.7981	3 29 55.9	13.050
11	13 12 50.54	1.7999	3 42 58.7	13.044
12	13 14 38.59	1.8018	3 56 1.1	13.037
13	13 16 26.76	1.8038	4 9 3.1	13.029
14	13 18 15.05	1.8059	4 22 4.6	13.021
15	13 20 3.47	1.8081	4 35 5.6	13.012
16	13 21 52.02	1.8103	4 48 6.1	13.002
17	13 23 40.70	1.8125	5 1 5.9	12.992
18	13 25 29.52	1.8148	5 14 5.1	12.981
19	13 27 18.48	1.8173	5 27 3.6	12.969
20	13 29 7.60	1.8199	5 40 1.4	12.956
21	13 30 56.87	1.8225	5 52 58.4	12.943
22	13 32 46.30	1.8252	6 5 54.6	12.930
23	13 34 35.89	1.8278	S. 6 18 50.0	12.916

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 36 25.64	1.8306	S. 6 31 44.5	12.901
1	13 38 15.56	1.8335	6 44 38.1	12.884
2	13 40 5.66	1.8366	6 57 30.6	12.867
3	13 41 55.95	1.8397	7 10 22.1	12.849
4	13 43 46.43	1.8428	7 23 12.5	12.831
5	13 45 37.09	1.8459	7 36 1.8	12.812
6	13 47 27.94	1.8492	7 48 49.9	12.792
7	13 49 18.99	1.8526	8 1 36.8	12.772
8	13 51 10.25	1.8561	8 14 22.5	12.750
9	13 53 1.72	1.8596	8 27 6.8	12.728
10	13 54 53.40	1.8632	8 39 49.8	12.705
11	13 56 45.30	1.8668	8 52 31.4	12.681
12	13 58 37.41	1.8704	9 5 11.5	12.656
13	14 0 29.75	1.8743	9 17 50.1	12.630
14	14 2 22.33	1.8782	9 30 27.1	12.604
15	14 4 15.14	1.8822	9 43 2.5	12.577
16	14 6 8.19	1.8862	9 55 36.3	12.549
17	14 8 1.49	1.8903	10 8 8.4	12.520
18	14 9 55.03	1.8944	10 20 38.7	12.490
19	14 11 48.82	1.8987	10 33 7.2	12.459
20	14 13 42.87	1.9031	10 45 33.8	12.427
21	14 15 37.19	1.9075	10 57 58.5	12.395
22	14 17 31.77	1.9120	11 10 21.2	12.362
23	14 19 26.63	1.9166	11 22 41.9	12.327
24	14 21 21.76	1.9212	S. 11 35 0.5	12.292

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 21 21.76	1.9212	S. 11 35 0.5	12.292
1	14 23 17.17	1.9259	11 47 16.9	12.256
2	14 25 12.87	1.9306	11 59 31.2	12.219
3	14 27 8.85	1.9354	12 11 43.2	12.181
4	14 29 5.12	1.9403	12 23 52.9	12.142
5	14 31 1.69	1.9454	12 36 0.2	12.101
6	14 32 58.57	1.9505	12 48 5.0	12.059
7	14 34 55.75	1.9556	13 0 7.3	12.017
8	14 36 53.24	1.9608	13 12 7.1	11 975
9	14 38 51.05	1.9661	13 24 4.3	11.931
10	14 40 49.18	1.9715	13 35 58.8	11.886
11	14 42 47.63	1.9769	13 47 50.6	11.840
12	14 44 46.40	1.9823	13 59 39.6	11.792
13	14 46 45.50	1.9879	14 11 25.7	11.744
14	14 48 44.94	1.9936	14 23 8.9	11.695
15	14 50 44.73	1.9993	14 34 49.1	11.644
16	14 52 44.86	2.0050	14 46 26.2	11.592
17	14 54 45.33	2.0108	14 58 0.1	11.539
18	14 56 46.15	2.0167	15 9 30.9	11.486
19	14 58 47.33	2.0227	15 20 58.4	11.431
20	15 0 48.87	2.0287	15 32 22.6	11.374
21	15 2 50.77	2.0347	15 43 43.3	11.317
22	15 4 53.03	2.0408	15 55 0.6	11.259
23	15 6 55.67	2.0471	S. 16 6 14.4	11.199

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 8 58.68	2.0534	S. 16 17 24.5	11.138
1	15 11 2.07	2.0597	16 28 30.9	11.076
2	15 13 5.84	2.0660	16 39 33.6	11.013
3	15 15 9.99	2.0724	16 50 32.5	10.949
4	15 17 14.53	2.0789	17 1 27.5	10.883
5	15 19 19.46	2.0855	17 12 18.5	10.815
6	15 21 24.79	2.0921	17 23 5.3	10.746
7	15 23 30.51	2.0988	17 33 48.0	10.677
8	15 25 36.64	2.1055	17 44 26.6	10.607
.9	15 27 43.17	2.1122	17 55 0.9	10.535
10	15 29 50.10	2.1189	18 5 30.8	10.462
11	15 31 57.44	2.1258	18 15 56.3	10.388
12	15 34 5.20	2.1327	18 26 17.3	10.312
13	15 36 13.37	2.1397	18 36 33.7	10.234
14	15 38 21.96	2.1467	18 46 45.4	10.155
15	15 40 30.97	2.1537	18 56 52.3	10.075
16	15 42 40.41	2.1608	19 6 54.4	9.993
17	15 44 50.27	2.1678	19 16 51.5	9.910
18	15 47 0.55	2.1749	19 26 43.6	9.826
19	15 49 11.26	2.1821	19 36 30.6	9.741
20	15 51 22.41	2.1894	19 46 12.5	9.654
21	15 53 33.99	2.1967	19 55 49.1	9.565
22	15 55 46.01	2.2039	20 5 20.3	9.475
23	15 57 58.46	2.2112	20 14 46.1	9.384
24	16 0 11.35	2.2185	S. 20 24 6.4	9.292

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 0 11.35	2.2185	S.20 24 6.4	9.292	0	17 55 0.80	2.5502	S.25 35 4.2	3.103
1	16 2 24.68	2.2258	20 33 21.1	9.198	1	17 57 33.97	2.5555	25 38 5.5	2.940
2	16 4 38.45	2.2332	20 42 30.1	9.102	2	18 0 7.46	2.5607	25 40 57.0	2.777
3	16 6 52.67	2.2406	20 51 33.3	9.004	3	18 2 41.26	2.5657	25 43 38.7	2.613
4	16 9 7.33	2.2480	21 0 30.6	8.906	4	18 5 15.35	2.5707	25 46 10.5	2.446
5	16 11 22.43	2.2554	21 9 22.0	8.807	5	18 7 49.74	2.5755	25 48 32.2	2.278
6	16 13 37.98	2.2629	21 18 7.4	8.705	6	18 10 24.41	2.5801	25 50 43.8	2.109
7	16 15 53.98	2.2703	21 26 46.6	8.602	7	18 12 59.35	2.5847	25 52 45.3	1.941
8	16 18 10.42	2.2777	21 35 19.6	8.498	8	18 15 34.57	2.5892	25 54 36.7	1.771
9	16 20 27.31	2.2852	21 43 46.3	8.392	9	18 18 10.05	2.5934	25 56 17.8	1.599
10	16 22 44.65	2.2927	21 52 6.6	8.284	10	18 20 45.78	2.5976	25 57 48.6	1.427
11	16 25 2.43	2.3001	22 0 20.4	8.175	11	18 23 21.76	2.6016	25 59 9.0	1.254
12	16 27 20.66	2.3076	22 8 27.6	8.064	12	18 25 57.97	2.6054	26 0 19.1	1.081
13	16 29 39.34	2.3151	22 16 28.1	7.952	13	18 28 34.41	2.6092	26 1 18.7	0.906
14	16 31 58.47	2.3225	22 24 21.9	7.839	14	18 31 11.07	2.6127	26 2 7.8	0.731
15	16 34 18.04	2.3299	22 32 8.8	7.724	15	18 33 47.93	2.6160	26 2 46.4	0.555
16	16 36 38.06	2.3373	22 39 48.8	7.607	16	18 36 24.99	2.6193	26 3 14.4	0.378
17	16 38 58.52	2.3448	22 47 21.7	7.489	17	18 39 2.25	2.6225	26 3 31.7	0.200
18	16 41 19.43	2.3522	22 54 47.5	7.370	18	18 41 39.69	2.6254	26 3 38.4	− 0.022
19	16 43 40.78	2.3595	23 2 6.1	7.249	19	18 44 17.30	2.6282	26 3 34.4	+ 0.157
20	16 46 2.57	2.3669	23 9 17.4	7.126	20	18 46 55.07	2.6308	26 3 19.6	0.336
21	16 48 24.81	2.3743	23 16 21.2	7.001	21	18 49 33.00	2.6333	26 2 54.1	0.515
22	16 50 47.49	2.3816	23 23 17.5	6.876	22	18 52 11.07	2.6357	26 2 17.8	0.695
23	16 53 10.60	2.3888	S.23 30 6.3	6.750	23	18 54 49.28	2.6379	S.26 1 30.7	0.876
	SATURDAY 18.					MONDAY 20.			
0	16 55 34.14	2.3960	S.23 36 47.5	6.622	0	18 57 27.62	2.6399	S.26 0 32.7	1.057
1	16 57 58.12	2.4032	23 43 20.9	6.491	1	19 0 6.07	2.6417	25 59 23.8	1.239
2	17 0 22.53	2.4103	23 49 46.4	6.358	2	19 2 44.63	2.6434	25 58 4.0	1.420
3	17 2 47.36	2.4174	23 56 3.9	6.225	3	19 5 23.28	2.6449	25 56 33.4	1.601
4	17 5 12.62	2.4245	24 2 13.4	6.091	4	19 8 2.02	2.6463	25 54 51.9	1.783
5	17 7 38.30	2.4314	24 8 14.8	5.955	5	19 10 40.84	2.6475	25 52 59.4	1.966
6	17 10 4.39	2.4383	24 14 8.0	5.817	6	19 13 19.72	2.6485	25 50 55.9	2.149
7	17 12 30.90	2.4452	24 19 52.9	5.678	7	19 15 58.66	2.6494	25 48 41.5	2.332
8	17 14 57.82	2.4521	24 25 29.4	5.538	8	19 18 37.65	2.6501	25 46 16.1	2.514
9	17 17 25.15	2.4588	24 30 57.4	5.396	9	19 21 16.67	2.6506	25 43 39.8	2.697
10	17 19 52.88	2.4655	24 36 16.9	5.252	10	19 23 55.72	2.6510	25 40 52.5	2.880
11	17 22 21.01	2.4722	24 41 27.7	5.107	11	19 26 34.79	2.6512	25 37 54.2	3.062
12	17 24 49.54	2.4787	24 46 29.7	4.960	12	19 29 13.87	2.6513	25 34 45.0	3.245
13	17 27 18.46	2.4852	24 51 22.9	4.813	13	19 31 52.95	2.6512	25 31 24.8	3.427
14	17 29 47.76	2.4915	24 56 7.3	4.665	14	19 34 32.01	2.6508	25 27 53.7	3.609
15	17 32 17.44	2.4978	25 0 42.7	4.514	15	19 37 11.05	2.6504	25 24 11.7	3.791
16	17 34 47.50	2.5041	25 5 9.0	4.362	16	19 39 50.06	2.6498	25 20 18.8	3.972
17	17 37 17.93	2.5102	25 9 26.2	4.210	17	19 42 29.03	2.6492	25 16 15.0	4.154
18	17 39 48.72	2.5162	25 13 34.2	4.056	18	19 45 7.96	2.6483	25 12 0.3	4.335
19	17 42 19.87	2.5222	25 17 32.9	3.900	19	19 47 46.82	2.6471	25 7 34.8	4.515
20	17 44 51.38	2.5280	25 21 22.2	3.743	20	19 50 25.61	2.6459	25 2 58.5	4.695
21	17 47 23.23	2.5337	25 25 2.1	3.585	21	19 53 4.33	2.6446	24 58 11.4	4.875
22	17 49 55.42	2.5393	25 28 32.4	3.425	22	19 55 42.96	2.6431	24 53 13.5	5.054
23	17 52 27.95	2.5448	25 31 53.1	3.265	23	19 58 21.50	2.6414	24 48 4.9	5.233
24	17 55 0.80	2.5502	S.25 35 4.2	3.103	24	20 0 59.93	2.6396	S.24 42 45.6	5.411

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	20	0	59.93	2.6396	S.24	42	45.6	5.411
1	20	3	38.25	2.6377	24	37	15.6	5.588
2	20	6	16.45	2.6355	24	31	35.0	5.764
3	20	8	54.51	2.6332	24	25	43.9	5.939
4	20	11	32.43	2.6308	24	19	42.3	6.114
5	20	14	10.21	2.6284	24	13	30.2	6.288
6	20	16	47.84	2.6257	24	7	7.7	6.462
7	20	19	25.30	2.6229	24	0	34.8	6.634
8	20	22	2.59	2.6201	23	53	51.6	6.806
9	20	24	39.71	2.6171	23	46	58.1	6.977
10	20	27	16.64	2.6138	23	39	54.4	7.147
11	20	29	53.37	2.6105	23	32	40.5	7.315
12	20	32	29.90	2.6072	23	25	16.6	7.482
13	20	35	6.23	2.6037	23	17	42.7	7.648
14	20	37	42.34	2.6000	23	9	58.8	7.813
15	20	40	18.23	2.5963	23	2	5.1	7.977
16	20	42	53.90	2.5925	22	54	1.6	8.140
17	20	45	29.33	2.5885	22	45	48.3	8.302
18	20	48	4.52	2.5844	22	37	25.4	8.462
19	20	50	39.46	2.5803	22	28	52.9	8.621
20	20	53	14.16	2.5762	22	20	10.9	8.778
21	20	55	48.60	2.5718	22	11	19.5	8.934
22	20	58	22.78	2.5674	22	2	18.8	9.089
23	21	0	56.69	2.5629	S.21	53	8.8	9.242

WEDNESDAY 22.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	21	3	30.33	2.5583	S.21	43	49.7	9.394
1	21	6	3.69	2.5537	21	34	21.5	9.545
2	21	8	36.77	2.5490	21	24	44.3	9.694
3	21	11	9.57	2.5442	21	14	58.2	9.842
4	21	13	42.08	2.5393	21	5	3.3	9.988
5	21	16	14.29	2.5344	20	54	59.6	10.132
6	21	18	46.21	2.5296	20	44	47.4	10.274
7	21	21	17.83	2.5244	20	34	26.7	10.416
8	21	23	49.14	2.5193	20	23	57.5	10.556
9	21	26	20.15	2.5142	20	13	20.0	10.693
10	21	28	50.85	2.5090	20	2	34.3	10.829
11	21	31	21.23	2.5037	19	51	40.5	10.964
12	21	33	51.30	2.4985	19	40	38.6	11.097
13	21	36	21.05	2.4932	19	29	28.8	11.228
14	21	38	50.48	2.4878	19	18	11.2	11.357
15	21	41	19.59	2.4825	19	6	45.9	11.485
16	21	43	48.38	2.4771	18	55	13.0	11.611
17	21	46	16.84	2.4717	18	43	32.6	11.736
18	21	48	44.98	2.4662	18	31	44.7	11.858
19	21	51	12.79	2.4607	18	19	49.6	11.978
20	21	53	40.27	2.4552	18	7	47.3	12.097
21	21	56	7.42	2.4497	17	55	37.9	12.214
22	21	58	34.24	2.4442	17	43	21.6	12.329
23	22	1	0.73	2.4387	17	30	58.4	12.443
24	22	3	26.89	2.4332	S.17	18	28.4	12.555

THURSDAY 23.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	22	3	26.89	2.4332	S.17	18	28.4	12.555
1	22	5	52.72	2.4277	17	5	51.8	12.664
2	22	8	18.22	2.4222	16	53	8.7	12.772
3	22	10	43.38	2.4166	16	40	19.2	12.878
4	22	13	8.21	2.4112	16	27	23.4	12.982
5	22	15	32.72	2.4057	16	14	21.4	13.083
6	22	17	56.90	2.4002	16	1	13.4	13.183
7	22	20	20.75	2.3947	15	47	59.4	13.282
8	22	22	44.27	2.3892	15	34	39.6	13.378
9	22	25	7.46	2.3838	15	21	14.0	13.473
10	22	27	30.33	2.3785	15	7	42.8	13.566
11	22	29	52.88	2.3731	14	54	6.1	13.657
12	22	32	15.10	2.3677	14	40	24.0	13.746
13	22	34	37.00	2.3624	14	26	36.6	13.832
14	22	36	58.58	2.3571	14	12	44.1	13.917
15	22	39	19.85	2.3518	13	58	46.5	14.001
16	22	41	40.80	2.3466	13	44	44.0	14.082
17	22	44	1.44	2.3413	13	30	36.7	14.162
18	22	46	21.76	2.3361	13	16	24.6	14.240
19	22	48	41.77	2.3310	13	2	7.9	14.315
20	22	51	1.48	2.3260	12	47	46.8	14.388
21	22	53	20.89	2.3210	12	33	21.3	14.461
22	22	55	40.00	2.3159	12	18	51.5	14.531
23	22	57	58.80	2.3109	S.12	4	17.6	14.598

FRIDAY 24.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
0	23	0	17.31	2.3061	S.11	49	39.7	14.664
1	23	2	35.53	2.3012	11	34	57.9	14.728
2	23	4	53.46	2.2964	11	20	12.3	14.790
3	23	7	11.10	2.2917	11	5	22.9	14.853
4	23	9	28.46	2.2870	10	50	29.9	14.912
5	23	11	45.54	2.2824	10	35	33.5	14.968
6	23	14	2.35	2.2778	10	20	33.7	15.024
7	23	16	18.88	2.2732	10	5	30.6	15.077
8	23	18	35.14	2.2688	9	50	24.4	15.128
9	23	20	51.14	2.2645	9	35	15.2	15.178
10	23	23	6.88	2.2601	9	20	3.0	15.226
11	23	25	22.36	2.2558	9	4	48.0	15.272
12	23	27	37.58	2.2516	8	49	30.4	15.315
13	23	29	52.55	2.2475	8	34	10.2	15.358
14	23	32	7.28	2.2435	8	18	47.4	15.400
15	23	34	21.77	2.2395	8	3	22.2	15.439
16	23	36	36.02	2.2355	7	47	54.7	15.477
17	23	38	50.03	2.2316	7	32	25.0	15.512
18	23	41	3.81	2.2277	7	16	53.3	15.545
19	23	43	17.36	2.2240	7	1	19.6	15.578
20	23	45	30.69	2.2204	6	45	44.0	15.608
21	23	47	43.81	2.2169	6	30	6.7	15.636
22	23	49	56.72	2.2134	6	14	27.7	15.662
23	23	52	9.42	2.2099	5	58	47.2	15.687
24	23	54	21.91	2.2065	S. 5	43	5.2	15.711

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 54 21.91	2.2065	S. 5 43 5.2	15.711
1	23 56 34.20	2.2033	5 27 21.9	15.733
2	23 58 46.30	2.2001	5 11 37.3	15.753
3	0 0 58.21	2.1969	4 55 51.5	15.772
4	0 3 9.93	2.1938	4 40 4.7	15.788
5	0 5 21.47	2.1908	4 24 17.0	15.803
6	0 7 32.83	2.1879	4 8 28.4	15.816
7	0 9 44.02	2.1851	3 52 39.1	15.827
8	0 11 55.05	2.1824	3 36 49.1	15.838
9	0 14 5.91	2.1797	3 20 58.5	15.847
10	0 16 16.61	2.1771	3 5 7.5	15.853
11	0 18 27.16	2.1746	2 49 16.1	15.859
12	0 20 37.56	2.1721	2 33 24.4	15.863
13	0 22 47.81	2.1698	2 17 32.5	15.865
14	0 24 57.93	2.1676	2 1 40.6	15.865
15	0 27 7.92	2.1654	1 45 48.7	15.864
16	0 29 17.78	2.1632	1 29 56.9	15.862
17	0 31 27.51	2.1612	1 14 5.2	15.859
18	0 33 37.12	2.1592	0 58 13.8	15.853
19	0 35 46.61	2.1573	0 42 22.8	15.846
20	0 37 56.00	2.1556	0 26 32.3	15.838
21	0 40 5.28	2.1539	S. 0 10 42.3	15.828
22	0 42 14.46	2.1522	N. 0 5 7.0	15.816
23	0 44 23.54	2.1506	0 20 55.6	15.802

SUNDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 46 32.53	2.1491	N. 0 36 43.3	15.787
1	0 48 41.44	2.1477	0 52 30.1	15.772
2	0 50 50.26	2.1463	1 8 15.9	15.755
3	0 52 59.00	2.1451	1 24 0.7	15.737
4	0 55 7.67	2.1440	1 39 44.3	15.716
5	0 57 16.28	2.1429	1 55 26.6	15.694
6	0 59 24.82	2.1418	2 11 7.6	15.672
7	1 1 33.30	2.1409	2 26 47.2	15.647
8	1 3 41.73	2.1401	2 42 25.2	15.620
9	1 5 50.12	2.1394	2 58 1.6	15.592
10	1 7 58.46	2.1387	3 13 36.3	15.564
11	1 10 6.76	2.1381	3 29 9.3	15.535
12	1 12 15.03	2.1376	3 44 40.5	15.503
13	1 14 23.27	2.1371	4 0 9.7	15.470
14	1 16 31.48	2.1367	4 15 36.9	15.436
15	1 18 39.67	2.1363	4 31 2.0	15.400
16	1 20 47.84	2.1361	4 46 24.9	15.363
17	1 22 56.00	2.1359	5 1 45.6	15.325
18	1 25 4.15	2.1358	5 17 3.9	15.285
19	1 27 12.30	2.1358	5 32 19.8	15.244
20	1 29 20.45	2.1359	5 47 33.2	15.203
21	1 31 28.61	2.1361	6 2 44.1	15.160
22	1 33 36.78	2.1363	6 17 52.4	15.115
23	1 35 44.96	2.1365	6 32 57.9	15.068
24	1 37 53.16	2.1368	N. 6 48 0.6	15.021

MONDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 37 53.16	2.1368	N. 6 48 0.6	15.021
1	1 40 1.38	2.1372	7 3 0.4	14.972
2	1 42 9.63	2.1378	7 17 57.3	14.923
3	1 44 17.92	2.1385	7 32 51.2	14.872
4	1 46 26.25	2.1391	7 47 41.9	14.819
5	1 48 34.61	2.1397	8 2 29.4	14.765
6	1 50 43.01	2.1404	8 17 13.7	14.710
7	1 52 51.46	2.1413	8 31 54.6	14.654
8	1 54 59.97	2.1422	8 46 32.1	14.597
9	1 57 8.53	2.1432	9 1 6.2	14.538
10	1 59 17.15	2.1442	9 15 36.7	14.478
11	2 1 25.84	2.1453	9 30 3.6	14.417
12	2 3 34.59	2.1465	9 44 26.8	14.355
13	2 5 43.42	2.1477	9 58 46.2	14.292
14	2 7 52.32	2.1490	10 13 1.8	14.227
15	2 10 1.30	2.1503	10 27 13.5	14.161
16	2 12 10.36	2.1517	10 41 21.1	14.094
17	2 14 19.51	2.1532	10 55 24.7	14.026
18	2 16 28.75	2.1547	11 9 24.2	13.957
19	2 18 38.08	2.1563	11 23 19.5	13.886
20	2 20 47.51	2.1580	11 37 10.5	13.813
21	2 22 57.04	2.1597	11 50 57.1	13.740
22	2 25 6.67	2.1614	12 4 39.3	13.667
23	2 27 16.41	2.1631	N.12 18 17.1	13.593

TUESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 29 26.25	2.1650	N.12 31 50.4	13.517
1	2 31 36.21	2.1670	12 45 19.1	13.438
2	2 33 46.29	2.1689	12 58 43.0	13.359
3	2 35 56.48	2.1709	13 12 2.2	13.280
4	2 38 6.79	2.1729	13 25 16.6	13.199
5	2 40 17.23	2.1751	13 38 26.1	13.117
6	2 42 27.80	2.1772	13 51 30.6	13.033
7	2 44 38.50	2.1794	14 4 30.1	12.949
8	2 46 49.33	2.1816	14 17 24.5	12.864
9	2 49 0.29	2.1838	14 30 13.8	12.778
10	2 51 11.39	2.1862	14 42 57.9	12.691
11	2 53 22.63	2.1886	14 55 36.7	12.602
12	2 55 34.02	2.1910	15 8 10.1	12.512
13	2 57 45.55	2.1934	15 20 38.1	12.422
14	2 59 57.22	2.1958	15 33 0.7	12.330
15	3 2 9.04	2.1983	15 45 17.7	12.237
16	3 4 21.01	2.2008	15 57 29.1	12.143
17	3 6 33.14	2.2034	16 9 34.9	12.048
18	3 8 45.42	2.2060	16 21 34.9	11.952
19	3 10 57.86	2.2086	16 33 29.1	11.855
20	3 13 10.45	2.2112	16 45 17.5	11.757
21	3 15 23.20	2.2138	16 57 0.0	11.658
22	3 17 36.11	2.2165	17 8 36.5	11.558
23	3 19 49.18	2.2192	17 20 7.0	11.457
24	3 22 2.42	2.2220	N.17 31 31.3	11.354

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 22 2.42	2.2220	N.17 31 31.3	11.354
1	3 24 15.82	2.2247	17 42 49.5	11.251
2	3 26 29.39	2.2275	17 54 1.5	11.147
3	3 28 43.12	2.2303	18 5 7.2	11.042
4	3 30 57.02	2.2331	18 16 6.6	10.937
5	3 33 11.09	2.2358	18 26 59.6	10.829
6	3 35 25.32	2.2386	18 37 46.1	10.721
7	3 37 39.72	2.2415	18 48 26.1	10.612
8	3 39 54.30	2.2444	18 58 59.6	10.503
9	3 42 9.05	2.2473	19 9 26.5	10.393
10	3 44 23.97	2.2501	19 19 46.7	10.280
11	3 46 39.06	2.2529	19 30 0.1	10.167
12	3 48 54.31	2.2557	19 40 6.7	10.053
13	3 51 9.74	2.2586	19 50 6.5	9.939
14	3 53 25.34	2.2614	19 59 59.4	9.823
15	3 55 41.11	2.2642	20 9 45.3	9.707
16	3 57 57.05	2.2670	20 19 24.2	9.590
17	4 0 13.15	2.2698	20 28 56.1	9.472
18	4 2 29.43	2.2727	20 38 20.9	9.354
19	4 4 45.88	2.2755	20 47 38.6	9.234
20	4 7 2.49	2.2783	20 56 49.0	9.113
21	4 9 19.27	2.2811	21 5 52.1	8.991
22	4 11 36.22	2.2838	21 14 47.9	8.869
23	4 13 53.33	2.2865	N.21 23 36.4	8.747

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 16 10.60	2.2893	N.21 32 17.5	8.623
1	4 18 28.04	2.2920	21 40 51.2	8.499
2	4 20 45.64	2.2946	21 49 17.4	8.373
3	4 23 3.39	2.2972	21 57 36.0	8.247
4	4 25 21.30	2.2998	22 5 47.0	8.119
5	4 27 39.37	2.3024	22 13 50.3	7.991
6	4 29 57.59	2.3049	22 21 45.9	7.862
7	4 32 15.96	2.3074	22 29 33.8	7.734
8	4 34 34.48	2.3099	22 37 14.0	7.605
9	4 36 53.15	2.3123	22 44 46.4	7.475
10	4 39 11.96	2.3147	22 52 11.0	7.343
11	4 41 30.92	2.3171	22 59 27.6	7.211
12	4 43 50.02	2.3194	23 6 36.3	7.078
13	4 46 9.25	2.3217	23 13 37.0	6.945
14	4 48 28.62	2.3239	23 20 29.7	6.812
15	4 50 48.12	2.3261	23 27 14.4	6.677
16	4 53 7.75	2.3282	23 33 51.0	6.542
17	4 55 27.50	2.3303	23 40 19.5	6.407
18	4 57 47.38	2.3323	23 46 39.8	6.271
19	5 0 7.38	2.3342	23 52 52.0	6.134
20	5 2 27.49	2.3361	23 58 55.9	5.997
21	5 4 47.71	2.3379	24 4 51.6	5.859
22	5 7 8.04	2.3397	24 10 39.0	5.721
23	5 9 28.48	2.3415	24 16 18.1	5.582
24	5 11 49.02	2.3431	N.24 21 48.8	5.442

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 11 49.02	2.3431	N.24 21 48.8	5.442
1	5 14 9.65	2.3447	24 27 11.2	5.303
2	5 16 30.38	2.3463	24 32 25.2	5.163
3	5 18 51.20	2.3478	24 37 30.8	5.023
4	5 21 12.11	2.3491	24 42 28.0	4.882
5	5 23 33.09	2.3503	24 47 16.7	4.742
6	5 25 54.15	2.3516	24 51 57.0	4.601
7	5 28 15.28	2.3528	24 56 28.8	4.458
8	5 30 36.48	2.3539	25 0 52.0	4.316
9	5 32 57.75	2.3549	25 5 6.7	4.173
10	5 35 19.07	2.3558	25 9 12.8	4.030
11	5 37 40.44	2.3567	25 13 10.3	3.886
12	5 40 1.87	2.3575	25 16 59.3	3.745
13	5 42 23.34	2.3582	25 20 39.7	3.601
14	5 44 44.85	2.3588	25 24 11.4	3.457
15	5 47 6.39	2.3593	25 27 34.5	3.313
16	5 49 27.96	2.3598	25 30 49.0	3.169
17	5 51 49.56	2.3602	25 33 54.8	3.024
18	5 54 11.18	2.3604	25 36 51.9	2.879
19	5 56 32.81	2.3606	25 39 40.3	2.735
20	5 58 54.45	2.3607	25 42 20.1	2.591
21	6 1 16.10	2.3608	25 44 51.2	2.446
22	6 3 37.75	2.3607	25 47 13.6	2.301
23	6 5 59.39	2.3606	N.25 49 27.3	2.157

SATURDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 8 21.02	2.3603	N.25 51 32.4	2.012

PHASES OF THE MOON.

		d	h	m
● New Moon . . .	July	5	15	58.5
☽ First Quarter		13	17	28.9
○ Full Moon		21	1	54.1
☾ Last Quarter		27	16	32.6

		d	h
☾ Apogee	July	11	6.4
☾ Perigee		23	5.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Aquilæ W.	101° 21′ 13″	3267	102° 46′ 3″	3285	104° 10′ 32″	3306	105° 34′ 37″	3327
	Fomalhaut W.	70 27 7	2623	72 5 31	2626	73 43 50	2630	75 22 4	2635
	α Pegasi W.	53 41 49	3078	55 10 25	3060	56 39 24	3043	58 8 44	3028
	VENUS E.	35 53 41	2843	34 20 9	2852	32 46 48	2861	31 13 39	2869
	SUN E.	57 12 2	2754	55 36 34	2762	54 1 16	2771	52 26 10	2779
2	Fomalhaut W.	83 31 29	2663	85 8 58	2671	86 46 17	2678	88 23 26	2686
	α Pegasi W.	65 39 3	2984	67 9 36	2980	68 40 14	2977	70 10 56	2974
	α Arietis W.	22 16 53	3282	23 41 26	3188	25 7 49	3114	26 35 41	3056
	SUN E.	44 33 24	2823	42 59 26	2832	41 25 40	2842	39 52 6	2852
3	Fomalhaut W.	96 26 28	2730	98 2 28	2740	99 38 15	2750	101 13 48	2761
	α Pegasi W.	77 44 36	2981	79 15 13	2985	80 45 45	2989	82 16 12	2994
	α Arietis W.	34 9 22	2888	35 41 56	2871	37 14 52	2857	38 48 6	2846
	SUN E.	32 7 31	2904	30 35 17	2916	29 3 19	2928	27 31 36	2941
4	Fomalhaut W.	109 7 49	2821	110 41 49	2835	112 15 31	2849	113 48 55	2864
	α Pegasi W.	89 46 26	3032	91 15 59	3043	92 45 19	3052	94 14 27	3064
	α Arietis W.	46 36 51	2821	48 10 51	2821	49 44 51	2822	51 18 50	2824
	SUN E.	19 57 23	3019	18 27 34	3040	16 58 11	3065	15 29 19	3096
7	SUN W.	16 4 54	3294	17 29 13	3293	18 53 33	3294	20 17 52	3296
	Regulus E.	27 59 13	2931	26 27 34	2950	24 56 18	2969	23 25 26	2990
	Spica E.	81 57 0	2883	80 24 20	2893	78 51 52	2903	77 19 37	2912
	Antares E.	127 51 28	2881	126 18 45	2891	124 46 14	2899	123 13 54	2908
8	SUN W.	27 18 21	3322	28 42 7	3329	30 5 46	3336	31 29 16	3343
	Spica E.	69 41 23	2960	68 10 20	2969	66 39 28	2978	65 8 48	2987
	Antares E.	115 35 1	2951	114 3 47	2959	112 32 43	2967	111 1 49	2976
9	SUN W.	38 24 46	3377	39 47 29	3384	41 10 4	3390	42 32 32	3396
	Spica E.	57 38 9	3029	56 8 32	3037	54 39 5	3044	53 9 47	3052
	Antares E.	103 29 48	3013	101 59 51	3019	100 30 2	3026	99 0 21	3032
10	SUN W.	49 23 12	3423	50 45 2	3427	52 6 48	3431	53 28 29	3435
	Spica E.	45 45 34	3087	44 17 8	3094	42 48 51	3101	41 20 42	3108
	Antares E.	91 33 46	3059	90 4 46	3064	88 35 52	3068	87 7 3	3071
11	SUN W.	60 16 0	3447	61 37 23	3449	62 58 44	3450	64 20 4	3450
	Regulus W.	21 8 17	3177	22 34 54	3167	24 1 43	3158	25 28 43	3151
	Spica E.	34 1 51	3139	32 34 29	3147	31 7 16	3154	29 40 12	3162
	Antares E.	79 43 56	3085	78 15 28	3086	76 47 1	3087	75 18 35	3087
12	SUN W.	71 6 49	3446	72 28 14	3443	73 49 42	3440	75 11 13	3436
	Regulus W.	32 45 48	3118	34 13 36	3113	35 41 30	3107	37 9 31	3101
	Antares E.	67 56 28	3085	66 28 0	3082	64 59 29	3081	63 30 56	3078
	α Aquilæ E.	112 47 22	4026	111 36 8	4005	110 24 33	3983	109 12 37	3964
13	SUN W.	82 0 0	3412	83 22 3	3406	84 44 13	3399	86 6 31	3391
	Regulus W.	44 31 27	3069	46 0 15	3062	47 29 11	3054	48 58 17	3046
	Antares E.	56 7 7	3057	54 38 5	3052	53 8 57	3047	51 39 42	3040
	α Aquilæ E.	103 8 22	3878	101 54 40	3863	100 40 43	3849	99 26 31	3835

GREENWICH MEAN TIME.

LUNAR DISTANCES

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Aquilæ	W.	106° 58′ 17″	3351	108° 21′ 30″	3376	109° 44′ 14″	3403	111° 6′ 27″	3432
	Fomalhaut	W.	77 0 12	2640	78 38 13	2646	80 16 6	2651	81 53 52	2657
	α Pegasi	W.	59 38 22	3016	61 8 15	3005	62 38 21	2997	64 8 38	2990
	Venus	E.	29 40 41	2879	28 7 55	2889	26 35 22	2898	25 3 1	2908
	Sun	E.	50 51 14	2787	49 16 29	2796	47 41 56	2805	46 7 34	2814
2	Fomalhaut	W.	90 0 25	2694	91 37 13	2702	93 13 50	2711	94 50 15	2720
	α Pegasi	W.	71 41 41	2973	73 12 27	2974	74 43 12	2976	76 13 55	2977
	α Arietis	W.	28 4 45	3007	29 34 49	2968	31 5 42	2936	32 37 15	2909
	Sun	E.	38 18 45	2861	36 45 36	2872	35 12 41	2882	33 39 59	2893
3	Fomalhaut	W.	102 49 7	2772	104 24 11	2784	105 59 0	2796	107 33 33	2809
	α Pegasi	W.	83 46 32	3001	85 16 44	3007	86 46 48	3015	88 16 42	3023
	α Arietis	W.	40 21 34	2838	41 55 13	2831	43 29 0	2827	45 2 53	2823
	Sun	E.	26 0 9	2954	24 28 59	2969	22 58 7	2985	21 27 35	3001
4	Fomalhaut	W.	115 22 0	2879	116 54 46	2895	118 27 11	2912	119 59 15	2928
	α Pegasi	W.	95 43 21	3075	97 12 1	3088	98 40 25	3101	100 8 33	3115
	α Arietis	W.	52 52 47	2826	54 26 41	2829	56 0 31	2833	57 34 16	2836
	Sun	E.	14 1 5	3136	12 33 39	3185	11 7 12	3243	9 41 54	3316
7	Sun	W.	21 42 8	3300	23 6 20	3304	24 30 27	3310	25 54 27	3315
	Regulus	E.	21 55 1	3014	20 25 6	3041	18 55 44	3071	17 26 59	3106
	Spica	E.	75 47 34	2923	74 15 44	2931	72 44 5	2941	71 12 38	2950
	Antares	E.	121 41 45	2916	120 9 47	2926	118 38 1	2935	117 6 26	2942
8	Sun	W.	32 52 38	3350	34 15 52	3357	35 38 58	3364	37 1 56	3371
	Spica	E.	63 38 19	2996	62 8 1	3004	60 37 53	3013	59 7 56	3021
	Antares	E.	109 31 6	2984	108 0 33	2991	106 30 9	2998	104 59 54	3005
9	Sun	W.	43 54 53	3402	45 17 7	3408	46 39 15	3414	48 1 16	3418
	Spica	E.	51 40 39	3060	50 11 40	3066	48 42 49	3073	47 14 7	3081
	Antares	E.	97 30 48	3038	96 1 22	3044	94 32 4	3049	93 2 52	3054
10	Sun	W.	54 50 6	3438	56 11 39	3441	57 33 9	3444	58 54 36	3446
	Spica	E.	39 52 40	3113	38 24 46	3119	36 57 0	3125	35 29 21	3133
	Antares	E.	85 38 18	3075	84 9 28	3078	82 41 1	3080	81 12 27	3082
11	Sun	W.	65 41 24	3450	67 2 44	3449	68 24 5	3449	69 45 26	3447
	Regulus	W.	26 55 51	3143	28 23 8	3136	29 50 34	3130	31 18 7	3124
	Spica	E.	28 13 17	3170	26 46 32	3180	25 19 59	3191	23 53 39	3204
	Antares	E.	73 50 10	3067	72 21 45	3067	70 53 20	3067	69 24 55	3066
12	Sun	W.	76 32 49	3432	77 54 29	3428	79 16 14	3423	80 38 4	3418
	Regulus	W.	38 37 39	3096	40 5 54	3089	41 34 17	3082	43 2 48	3076
	Antares	E.	62 2 19	3074	60 33 38	3071	59 4 53	3067	57 36 3	3062
	α Aquilæ	E.	108 0 22	3945	106 47 48	3928	105 34 57	3911	104 21 48	3894
13	Sun	W.	87 28 58	3383	88 51 34	3375	90 14 19	3366	91 37 14	3357
	Regulus	W.	50 27 33	3038	51 56 59	3029	53 26 36	3019	54 56 25	3010
	Antares	E.	50 10 19	3034	48 40 48	3027	47 11 9	3020	45 41 21	3013
	α Aquilæ	E.	98 12 5	3821	96 57 25	3808	95 42 31	3795	94 27 24	3784

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III$^{\text{h}}$.	P. L. of Diff.	VI$^{\text{h}}$.	P. L of Diff.	IX$^{\text{h}}$.	P. L. of Diff.
14	Sun	W.	93° 0′ 20″	3347	94° 23′ 37″	3336	95° 47′ 7″	3325	97° 10′ 49″	3314
	Regulus	W.	56 26 25	3000	57 56 38	2990	59 27 3	2979	60 57 42	2969
	Antares	E.	44 11 24	3005	42 41 17	2996	41 10 59	2988	39 40 31	2979
	α Aquilæ	E.	93 12 5	3772	91 56 34	3761	90 40 51	3750	89 24 57	3741
15	Sun	W.	104 12 44	3252	105 37 52	3238	107 3 16	3224	108 28 57	3209
	Regulus	W.	68 34 33	2907	70 6 43	2894	71 39 9	2880	73 11 53	2867
	Spica	W.	15 12 59	3168	16 39 47	3112	18 7 42	3065	19 36 35	3023
	Antares	E.	32 5 24	2935	30 33 49	2925	29 2 2	2917	27 30 5	2909
	α Aquilæ	E.	83 3 1	3698	81 46 12	3692	80 29 16	3686	79 12 14	3681
	Fomalhaut	E.	114 32 22	3097	113 4 9	3080	111 35 35	3062	110 6 39	3044
16	Sun	W.	115 41 50	3132	117 9 21	3115	118 37 12	3099	120 5 23	3082
	Regulus	W.	81 0 8	2793	82 34 45	2777	84 9 43	2762	85 45 1	2745
	Spica	W.	27 12 18	2869	28 45 16	2845	30 18 45	2823	31 52 43	2800
	α Aquilæ	E.	72 46 2	3670	71 28 43	3671	70 11 25	3674	68 54 10	3677
	Fomalhaut	E.	102 36 34	2957	101 5 27	2940	99 33 59	2923	98 2 9	2905
	α Pegasi	E.	120 4 3	3325	118 40 21	3294	117 16 3	3264	115 51 9	3233
17	Sun	W.	127 31 30	2996	129 1 48	2979	130 32 27	2962	132 3 28	2943
	Regulus	W.	93 46 58	2663	95 24 28	2646	97 2 21	2629	98 40 37	2612
	Spica	W.	39 49 44	2695	41 26 31	2675	43 3 44	2656	44 41 23	2636
	α Aquilæ	E.	62 29 42	3729	61 13 26	3746	59 57 28	3768	58 41 52	3792
	Fomalhaut	E.	90 17 28	2820	88 43 26	2803	87 9 2	2786	85 34 16	2770
	α Pegasi	E.	108 38 6	3097	107 9 53	3073	105 41 10	3048	104 11 57	3025
18	Regulus	W.	106 57 47	2527	108 38 23	2510	110 19 23	2493	112 0 46	2477
	Spica	W.	52 56 13	2541	54 36 29	2523	56 17 10	2504	57 58 17	2487
	α Aquilæ	E.	52 31 35	3980	51 19 36	4036	50 8 32	4099	48 58 29	4169
	Fomalhaut	E.	77 35 11	2692	75 58 21	2678	74 21 12	2664	72 43 44	2650
	α Pegasi	E.	96 38 51	2917	95 6 54	2898	93 34 33	2880	92 1 48	2862
19	Spica	W.	66 30 4	2401	68 13 38	2384	69 57 36	2368	71 41 56	2353
	Antares	W.	20 43 54	2465	22 25 57	2437	24 8 39	2412	25 51 57	2389
	Fomalhaut	E.	64 32 7	2593	62 53 3	2585	61 13 47	2577	59 34 20	2570
	α Pegasi	E.	84 12 40	2785	82 37 52	2772	81 2 48	2761	79 27 29	2750
20	Spica	W.	80 29 8	2280	82 15 37	2267	84 2 25	2254	85 49 32	2241
	Antares	W.	34 36 1	2294	36 22 9	2279	38 8 40	2264	39 55 33	2249
	Fomalhaut	E.	51 15 23	2558	49 35 30	2561	47 55 42	2567	46 16 2	2576
	α Pegasi	E.	71 27 55	2716	69 51 37	2713	68 15 15	2713	66 38 52	2714
	α Arietis	E.	113 25 48	2380	111 41 44	2363	109 57 16	2348	108 12 26	2333
21	Spica	W.	94 49 26	2189	96 38 10	2180	98 27 8	2172	100 16 18	2164
	Antares	W.	48 54 55	2189	50 43 39	2178	52 32 39	2170	54 21 52	2161
	α Pegasi	E.	58 38 14	2751	57 2 42	2767	55 27 31	2785	53 52 44	2808
	α Arietis	E.	99 23 23	2272	97 36 43	2263	95 49 49	2253	94 2 41	2245
22	Spica	W.	109 24 45	2135	111 14 51	2132	113 5 2	2128	114 55 19	2126
	Antares	W.	63 30 58	2127	65 21 16	2122	67 11 41	2118	69 2 13	2115
	α Arietis	E.	85 4 16	2215	83 16 11	2211	81 28 0	2208	79 39 45	2206
	Aldebaran	E.	115 32 44	2140	113 42 46	2136	111 52 41	2131	110 2 29	2127

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XV^{h}.	P.L. of Diff.	XVIII^{h}.	P.L. of Diff.	XXI^{h}.	P.L. of Diff.
14	Sun	W.	98° 34′ 44″	3303	99° 58′ 52″	3290	101° 23′ 15″	3278	102° 47′ 52″	3265
	Regulus	W.	62 28 34	2957	63 59 41	2945	65 31 3	2933	67 2 40	2920
	Antares	E.	38 9 52	2970	36 39 2	2962	35 8 1	2952	33 36 48	2943
	α Aquilæ	E.	88 8 53	3731	86 52 39	3722	85 36 15	3713	84 19 42	3706
15	Sun	W.	109 54 56	3194	111 21 12	3179	112 47 46	3164	114 14 38	3148
	Regulus	W.	74 44 54	2852	76 18 14	2838	77 51 53	2823	79 25 51	2808
	Spica	W.	21 6 19	2983	22 36 50	2953	24 8 2	2923	25 39 52	2894
	Antares	E.	25 57 57	2901	24 25 40	2896	22 53 16	2891	21 20 46	2886
	α Aquilæ	E.	77 55 7	3677	76 37 55	3673	75 20 39	3671	74 3 21	3670
	Fomalhaut	E.	108 37 21	3027	107 7 42	3009	105 37 41	2992	104 7 18	2975
16	Sun	W.	121 33 54	3065	123 2 47	3048	124 32 0	3031	126 1 34	3014
	Regulus	W.	87 20 41	2729	88 56 42	2713	90 33 5	2696	92 9 50	2679
	Spica	W.	33 27 11	2779	35 2 7	2756	36 37 32	2736	38 13 24	2715
	α Aquilæ	E.	67 36 59	3684	66 19 55	3692	65 2 59	3702	63 46 14	3714
	Fomalhaut	E.	96 29 57	2888	94 57 23	2871	93 24 27	2853	91 51 8	2837
	α Pegasi	E.	114 25 39	3204	112 59 35	3177	111 32 58	3149	110 5 48	3123
17	Sun	W.	133 34 52	2926	135 6 38	2909	136 38 45	2892	138 11 14	2875
	Regulus	W.	100 19 16	2594	101 58 19	2577	103 37 45	2561	105 17 34	2543
	Spica	W.	46 19 29	2617	47 58 1	2598	49 36 59	2579	51 16 23	2560
	α Aquilæ	E.	57 26 41	3820	56 12 0	3853	54 57 52	3890	53 44 22	3932
	Fomalhaut	E.	83 59 9	2753	82 23 40	2738	80 47 51	2722	79 11 41	2707
	α Pegasi	E.	102 42 15	3002	101 12 5	2980	99 41 27	2958	98 10 22	2936
18	Regulus	W.	113 42 32	2460	115 24 42	2444	117 7 14	2428	118 50 9	2412
	Spica	W.	59 39 49	2469	61 21 46	2451	63 4 8	2434	64 46 54	2417
	α Aquilæ	E.	47 49 34	4250	46 41 55	4341	45 35 40	4445	44 30 59	4563
	Fomalhaut	E.	71 5 57	2638	69 27 53	2626	67 49 33	2614	66 10 57	2604
	α Pegasi	E.	90 28 41	2845	88 55 11	2828	87 21 20	2813	85 47 9	2799
19	Spica	W.	73 26 39	2337	75 11 44	2322	76 57 11	2308	78 42 59	2294
	Antares	W.	27 35 48	2367	29 20 10	2348	31 5 0	2329	32 50 18	2311
	Fomalhaut	E.	57 54 44	2564	56 15 0	2561	54 35 11	2558	52 55 18	2556
	α Pegasi	E.	77 51 56	2741	76 16 10	2733	74 40 14	2725	73 4 8	2720
20	Spica	W.	87 36 58	2230	89 24 41	2219	91 12 40	2208	93 0 55	2198
	Antares	W.	41 42 47	2236	43 30 21	2223	45 18 15	2210	47 6 27	2200
	Fomalhaut	E.	44 36 34	2588	42 57 22	2603	41 18 31	2623	39 40 7	2646
	α Pegasi	E.	65 2 31	2717	63 26 14	2722	61 50 3	2729	60 14 2	2739
	α Arietis	E.	106 27 15	2320	104 41 44	2307	102 55 55	2295	101 9 48	2283
21	Spica	W.	102 5 40	2157	103 55 13	2151	105 44 55	2145	107 34 46	2139
	Antares	W.	56 11 19	2153	58 0 58	2145	59 50 48	2139	61 40 48	2132
	α Pegasi	E.	52 18 27	2835	50 44 44	2866	49 11 41	2901	47 39 24	2942
	α Arietis	E.	92 15 20	2237	90 27 48	2231	88 40 6	2225	86 52 15	2219
22	Spica	W.	116 45 39	2124	118 36 2	2123	120 26 26	2122	122 16 51	2123
	Antares	W.	70 52 50	2112	72 43 31	2109	74 34 16	2108	76 25 3	2107
	α Arietis	E.	77 51 27	2206	76 3 8	2205	74 14 48	2206	72 26 29	2207
	Aldebaran	E.	108 12 11	2124	106 21 48	2122	104 31 22	2120	102 40 53	2119

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III h.	P. L. of Diff.	VI h.	P. L. of Diff.	IX h.	P. L. of Diff.
23	Antares	W.	78° 15′ 51″	2107	80° 6′ 40″	2107	81° 57′ 28″	2108	83° 48′ 15″	2109
	α Aquilæ	W.	42 48 0	4354	43 54 3	4202	45 2 27	4067	46 13 1	3946
	α Arietis	E.	70 38 12	2210	68 49 59	2212	67 1 50	2217	65 13 48	2223
	Aldebaran	E.	100 50 23	2118	98 59 52	2118	97 9 21	2119	95 18 51	2121
24	Antares	W.	93 1 20	2125	94 51 41	2130	96 41 55	2136	98 32 0	2141
	α Aquilæ	W.	52 32 23	3514	53 52 32	3454	55 13 48	3400	56 36 5	3352
	α Arietis	E.	56 16 5	2264	54 29 12	2276	52 42 37	2289	50 56 21	2303
	Aldebaran	E.	86 7 15	2137	84 17 12	2141	82 27 16	2147	80 37 29	2153
	Sun	E.	139 18 2	2431	137 35 12	2435	135 52 27	2439	134 9 48	2444
25	Antares	W.	107 40 3	2176	109 29 6	2184	111 17 57	2193	113 6 35	2202
	α Aquilæ	W.	63 39 22	3185	65 5 49	3163	66 32 43	3144	67 59 59	3128
	Fomalhaut	W.	28 34 53	2997	30 5 10	2916	31 37 8	2852	33 10 29	2798
	α Arietis	E.	42 11 3	2401	40 27 29	2428	38 44 34	2457	37 2 20	2490
	Aldebaran	E.	71 31 0	2190	69 42 17	2198	67 53 47	2207	66 5 30	2216
	Sun	E.	125 38 31	2476	123 56 44	2485	122 15 9	2493	120 33 46	2502
26	α Aquilæ	W.	75 20 7	3086	76 48 34	3083	78 17 4	3083	79 45 34	3084
	Fomalhaut	W.	41 11 11	2643	42 49 8	2626	44 27 28	2612	46 6 6	2603
	Aldebaran	E.	57 7 48	2270	55 21 4	2281	53 34 37	2293	51 48 27	2306
	Sun	E.	112 10 3	2551	110 30 0	2561	108 50 12	2572	107 10 39	2584
27	α Aquilæ	W.	87 7 3	3114	88 34 56	3124	90 2 36	3135	91 30 3	3148
	Fomalhaut	W.	54 21 40	2583	56 0 58	2584	57 40 15	2586	59 19 29	2588
	α Pegasi	W.	39 39 27	3438	41 1 0	3373	42 23 47	3317	43 47 39	3268
	Aldebaran	E.	43 2 23	2373	41 18 10	2389	39 34 19	2404	37 50 51	2421
	Venus	E.	84 34 20	2726	82 58 15	2739	81 22 27	2752	79 46 56	2764
	Sun	E.	98 56 49	2642	97 18 51	2654	95 41 9	2666	94 3 44	2678
28	α Aquilæ	W.	98 42 58	3231	100 8 31	3251	101 33 40	3272	102 58 24	3295
	Fomalhaut	W.	67 34 21	2614	69 12 57	2621	70 51 23	2629	72 29 39	2637
	α Pegasi	W.	50 59 3	3107	52 27 4	3087	53 55 30	3070	55 24 16	3056
	Venus	E.	71 53 28	2828	70 19 36	2841	68 46 1	2854	67 12 43	2866
	Sun	E.	86 0 45	2741	84 24 59	2753	82 49 29	2766	81 14 16	2779
29	Fomalhaut	W.	80 38 10	2681	82 15 16	2691	83 52 8	2701	85 28 47	2710
	α Pegasi	W.	62 51 37	3015	64 21 31	3013	65 51 28	3011	67 21 27	3009
	Venus	E.	59 30 16	2930	57 58 35	2942	56 27 10	2955	54 56 1	2968
	Sun	E.	73 22 15	2840	71 48 39	2852	70 15 18	2864	68 42 13	2876
30	Fomalhaut	W.	93 28 37	2764	95 3 52	2775	96 38 53	2787	98 13 38	2798
	α Pegasi	W.	74 51 17	3020	76 21 5	3024	77 50 48	3029	79 20 25	3034
	α Arietis	W.	31 13 58	2970	32 44 48	2949	34 16 5	2931	35 47 44	2916
	Venus	E.	47 24 10	3030	45 54 34	3042	44 25 13	3055	42 56 8	3066
	Sun	E.	61 0 41	2936	59 29 8	2949	57 57 51	2960	56 26 48	2972
31	Fomalhaut	W.	106 3 31	2860	107 36 41	2873	109 9 34	2887	110 42 10	2900
	α Pegasi	W.	86 46 31	3071	88 15 16	3080	89 43 50	3090	91 12 12	3099
	α Arietis	W.	43 29 29	2892	45 2 11	2880	46 34 56	2879	48 7 42	2878
	Venus	E.	35 34 24	3128	34 6 48	3141	32 39 28	3153	31 12 23	3167
	Sun	E.	48 55 14	3030	47 25 39	3042	45 56 18	3054	44 27 12	3065

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
23	Antares	W.	85° 39′ 0″	2111	87° 29′ 42″	2114	89° 20′ 20″	2117	91° 10′ 53″	2121
	α Aquilæ	W.	47 25 34	3839	48 39 56	3744	49 55 57	3658	51 13 29	3582
	α Arietis	E.	63 25 54	2229	61 38 9	2236	59 50 35	2244	58 3 13	2253
	Aldebaran	E.	93 28 24	2123	91 38 0	2126	89 47 40	2129	87 57 25	2132
24	Antares	W.	100 21 57	2147	102 11 44	2154	104 1 21	2161	105 50 48	2169
	α Aquilæ	W.	57 59 16	3309	59 23 17	3272	60 48 1	3239	62 13 24	3209
	α Arietis	E.	49 10 26	2319	47 24 54	2337	45 39 48	2356	43 55 10	2378
	Aldebaran	E.	78 47 50	2159	76 58 21	2167	75 9 3	2174	73 19 56	2181
	Sun	E.	132 27 16	2449	130 44 51	2455	129 2 35	2462	127 20 28	2469
25	Antares	W.	114 54 59	2212	116 43 9	2221	118 31 5	2231	120 18 46	2242
	α Aquilæ	W.	69 27 35	3114	70 55 27	3105	72 23 31	3096	73 51 45	3090
	Fomalhaut	W.	34 44 59	2754	36 20 27	2717	37 56 44	2687	39 33 41	2663
	α Arietis	E.	35 20 53	2527	33 40 18	2569	32 0 41	2617	30 22 9	2672
	Aldebaran	E.	64 17 27	2227	62 29 39	2237	60 42 6	2247	58 54 49	2258
	Sun	E.	118 52 35	2511	117 11 37	2520	115 30 52	2530	113 50 20	2540
26	α Aquilæ	W.	81 14 3	3087	82 42 28	3091	84 10 48	3098	85 39 0	3105
	Fomalhaut	W.	47 44 57	2595	49 23 59	2589	51 3 9	2586	52 42 23	2584
	Aldebaran	E.	50 2 36	2318	48 17 3	2332	46 31 50	2345	44 46 56	2359
	Sun	E.	105 31 22	2596	103 52 20	2607	102 13 34	2618	100 35 3	2630
27	α Aquilæ	W.	92 57 14	3162	94 24 9	3178	95 50 45	3193	97 17 2	3211
	Fomalhaut	W.	60 58 40	2592	62 37 46	2597	64 16 45	2602	65 55 37	2608
	α Pegasi	W.	45 12 28	3225	46 38 7	3188	48 4 30	3158	49 31 30	3130
	Aldebaran	E.	36 7 45	2438	34 25 4	2455	32 42 48	2474	31 0 58	2494
	Venus	E.	78 11 41	2777	76 36 43	2789	75 2 1	2802	73 27 36	2815
	Sun	E.	92 26 35	2691	90 49 43	2703	89 13 7	2716	87 36 48	2728
28	α Aquilæ	W.	104 22 41	3320	105 46 29	3345	107 9 48	3373	108 32 35	3402
	Fomalhaut	W.	74 7 44	2645	75 45 38	2653	77 23 21	2662	79 0 52	2672
	α Pegasi	W.	56 53 20	3044	58 22 38	3034	59 52 9	3026	61 21 49	3020
	Venus	E.	65 39 41	2879	64 6 55	2892	62 34 26	2905	61 2 13	2917
	Sun	E.	79 39 20	2790	78 4 39	2803	76 30 15	2815	74 56 7	2828
29	Fomalhaut	W.	87 5 13	2721	88 41 25	2732	90 17 23	2742	91 53 7	2753
	α Pegasi	W.	68 51 28	3009	70 21 29	3011	71 51 28	3014	73 21 24	3016
	Venus	E.	53 25 8	2980	51 54 30	2993	50 24 8	3005	48 54 1	3018
	Sun	E.	67 9 24	2888	65 36 50	2901	64 4 32	2912	62 32 29	2924
30	Fomalhaut	W.	99 48 8	2810	101 22 23	2822	102 56 22	2835	104 30 5	2848
	α Pegasi	W.	80 49 55	3041	82 19 17	3047	83 48 31	3055	85 17 36	3063
	α Arietis	W.	37 19 42	2905	38 51 54	2896	40 24 18	2890	41 56 50	2884
	Venus	E.	41 27 17	3078	39 58 41	3091	38 30 20	3103	37 2 14	3116
	Sun	E.	54 56 0	2984	53 25 27	2995	51 55 8	3007	50 25 4	3018
31	Fomalhaut	W.	112 14 29	2914	113 46 30	2929	115 18 12	2943	116 49 36	2958
	α Pegasi	W.	92 40 23	3110	94 8 21	3120	95 36 6	3132	97 3 37	3143
	α Arietis	W.	49 40 29	2879	51 13 15	2881	52 45 58	2883	54 18 38	2887
	Venus	E.	29 45 34	3180	28 19 1	3194	26 52 45	3208	25 26 45	3222
	Sun	E.	42 58 20	3078	41 29 43	3089	40 1 20	3101	38 33 12	3114

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	8 45 21.43	9.714	N.18 2 35.9	−37.74	15 47.97	66.64	6 6.63	0.143
SUN.	2	8 49 14.25	9.689	17 47 21.2	38.47	15 48.09	66.56	6 2.91	0.168
Mon.	3	8 53 6.48	9.664	17 31 49.1	39.19	15 48.22	66.47	5 58.60	0.193
Tues.	4	8 56 58.11	9.640	17 15 59.8	−39.90	15 48.35	66.38	5 53 69	0.218
Wed.	5	9 0 49.15	9.615	16 59 53.7	40 60	15 48.49	66.29	5 48.19	0.242
Thur.	6	9 4 39.58	9.590	16 43 31.0	41.29	15 48.64	66.21	5 42.08	0.267
Frid.	7	9 8 29.41	9.564	16 26 52.1	−41.96	15 48.79	66.12	5 35 36	0.292
Sat.	8	9 12 18.63	9.538	16 9 57.3	42.61	15 48.94	66.04	5 28.04	0.318
SUN.	9	9 16 7.26	9.513	15 52 46.9	43.25	15 49.10	65.95	5 20.13	0.343
Mon.	10	9 19 55.30	9.488	15 35 21.3	−43.88	15 49.27	65.87	5 11.63	0.367
Tues.	11	9 23 42.74	9.464	15 17 40.7	44.50	15 49.44	65.79	5 2.55	0.392
Wed.	12	9 27 29.59	9.440	14 59 45.5	45.10	15 49.61	65.71	4 52.88	0.416
Thur.	13	9 31 15.87	9.416	14 41 36.0	−45.68	15 49.79	65.63	4 42.63	0.440
Frid.	14	9 35 1.58	9.393	14 23 12.5	46.26	15 49.97	65.55	4 31.82	0.463
Sat.	15	9 38 46.74	9.370	14 4 35.4	46.83	15 50.15	65.47	4 20.45	0.486
SUN.	16	9 42 31.35	9.348	13 45 44.9	−47.38	15 50.33	65.39	4 8.54	0.508
Mon.	17	9 46 15.43	9.326	13 26 41.4	47.91	15 50.52	65.31	3 56.09	0.530
Tues.	18	9 49 58.98	9.305	13 7 25.2	48.43	15 50.71	65.24	3 43.13	0.551
Wed.	19	9 53 42.03	9.285	12 47 56.6	−48.94	15 50.90	65.17	3 29.66	0.571
Thur.	20	9 57 24.59	9.265	12 28 15.9	49.44	15 51.09	65.10	3 15.71	0.591
Frid.	21	10 1 6.68	9.246	12 8 23.3	49.93	15 51.28	65.03	3 1.29	0 610
Sat.	22	10 4 48.33	9.227	11 48 19.2	−50.41	15 51.48	64.97	2 46.41	0.629
SUN.	23	10 8 29.53	9.208	11 28 3.8	50.87	15 51.68	64 90	2 31.09	0.647
Mon.	24	10 12 10.30	9.190	11 7 37.5	51.32	15 51 88	64.84	2 15.35	0.665
Tues.	25	10 15 50.66	9.173	10 47 0.5	−51.76	15 52.08	64.78	1 59.20	0.682
Wed.	26	10 19 30.63	9.157	10 26 13.2	52.18	15 52.29	64.72	1 42.66	0.698
Thur.	27	10 23 10.22	9.142	10 5 15.8	52.59	15 52.50	64.66	1 25.74	0.713
Frid.	28	10 26 49.45	9.127	9 44 8.7	−52.99	15 52.71	64.61	1 8.47	0.728
Sat.	29	10 30 28.34	9.113	9 22 52.2	53.37	15 52.92	64.56	0 50.86	0.742
SUN.	30	10 34 6.89	9.100	9 1 26.6	53.75	15 53.14	64.51	0 32.92	0.755
Mon.	31	10 37 45.13	9.087	8 39 52.3	54.11	15 53.36	64.46	0 14.65	0.768
Tues.	32	10 41 23.07	9.074	N. 8 18 9.5	−54.45	15 53.59	64.41	0 3.93	0.781

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	8 45 20.44	9.714	N. 18 2 39.7	−37.74	6 6.64	0.143	8 39 13.80
SUN.	2	8 49 13.28	9.689	17 47 25.1	38.47	6 2.92	0.168	8 43 10.36
Mon.	3	8 53 5.52	9.664	17 31 53.0	39.19	5 58.61	0.193	8 47 6.91
Tues.	4	8 56 57.17	9.640	17 16 3.7	−39.90	5 53.71	0.218	8 51 3.46
Wed.	5	9 0 48.22	9.615	16 59 57.6	40.60	5 48.21	0.242	8 55 0.01
Thur.	6	9 4 38.67	9.590	16 43 34.9	41.29	5 42.10	0.267	8 58 56.57
Frid.	7	9 8 28.52	9.565	16 26 56.0	−41.96	5 35.39	0.292	9 2 53.13
Sat.	8	9 12 17.76	9.539	16 10 1.1	42.61	5 28.07	0.318	9 6 49.69
SUN.	9	9 16 6.41	9.514	15 52 50.7	43.25	5 20.16	0.343	9 10 46.25
Mon.	10	9 19 54.47	9.490	15 35 25.0	−43.88	5 11.66	0.367	9 14 42.81
Tues.	11	9 23 41.94	9.465	15 17 44.4	44.50	5 2.58	0.392	9 18 39.36
Wed.	12	9 27 28.82	9.441	14 59 49.1	45.10	4 52.91	0.416	9 22 35.91
Thur.	13	9 31 15.13	9.417	14 41 39.5	−45.68	4 42.66	0.440	9 26 32.47
Frid.	14	9 35 0.87	9.394	14 23 16.0	46.26	4 31.85	0.463	9 30 29.02
Sat.	15	9 38 46.06	9.371	14 4 38.8	46.83	4 20.48	0.486	9 34 25.58
SUN.	16	9 42 30.70	9.349	13 45 48.2	−47.38	4 8.57	0.508	9 38 22.13
Mon.	17	9 46 14.81	9.327	13 26 44.6	47.92	3 56.12	0.530	9 42 18.69
Tues.	18	9 49 58.40	9.306	13 7 28.3	48.44	3 43.16	0.551	9 46 15.24
Wed.	19	9 53 41.49	9.286	12 47 59.5	−48.95	3 29.69	0.571	9 50 11.80
Thur.	20	9 57 24.09	9.266	12 28 18.6	49.45	3 15.74	0.591	9 54 8.35
Frid.	21	10 1 6.22	9.247	12 8 25.8	49.94	3 1.32	0.610	9 58 4.90
Sat.	22	10 4 47.90	9.228	11 48 21.5	−50.42	2 46.44	0.629	10 2 1.46
SUN.	23	10 8 29.14	9.210	11 28 5.9	50.88	2 31.12	0.647	10 5 58.02
Mon.	24	10 12 9.95	9.192	11 7 39.4	51.33	2 15.38	0.665	10 9 54.57
Tues.	25	10 15 50.35	9.175	10 47 2.2	−51.77	1 59.22	0.682	10 13 51.13
Wed.	26	10 19 30.36	9.159	10 26 14.7	52.19	1 42.68	0.698	10 17 47.68
Thur.	27	10 23 10.00	9.144	10 5 17.1	52.60	1 25.76	0.713	10 21 44.24
Frid.	28	10 26 49.28	9.129	9 44 9.7	−53.00	1 8.49	0.728	10 25 40.79
Sat.	29	10 30 28.21	9.115	9 22 52.9	53.38	0 50.87	0.742	10 29 37.34
SUN.	30	10 34 6.81	9.102	9 1 27.1	53.76	0 32.92	0.755	10 33 33.89
Mon.	31	10 37 45.10	9.089	8 39 52.5	54.12	0 14.65	0.768	10 37 30.45
Tues.	32	10 41 23.08	9.076	N. 8 18 9.4	−54.46	0 3.93	0.781	10 41 27.01

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 hour,
+9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S						Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	128 54 24.4	54 8.9	143.59	+ 0.31	0.0063828	−23.1	15 18 15.36
2	214	129 51 51.2	51 35.6	143.64	0.42	0.0063261	24.1	15 14 19.45
3	215	130 49 19.1	49 3.4	143.68	0.51	0.0062670	25.1	15 10 23.54
4	216	131 46 48.0	46 32.1	143.73	+ 0.58	0.0062055	−26.1	15 6 27.63
5	217	132 44 17.9	44 1.8	143.77	0.62	0.0061416	27.1	15 2 31.72
6	218	133 41 48.9	41 32.6	143.81	0.63	0.0060753	28.1	14 58 35.81
7	219	134 39 20.9	39 4.5	143.85	+ 0.61	0.0060067	−29.0	14 54 39.90
8	220	135 36 53.7	36 37.2	143.89	0.56	0.0059359	29.9	14 50 43.99
9	221	136 34 27.4	34 10.7	143.93	0.49	0.0058630	30.8	14 46 48.09
10	222	137 32 2.1	31 45.2	143.96	+ 0.39	0.0057879	−31.7	14 42 52.17
11	223	138 29 37.7	29 20.7	144.00	0.27	0.0057108	32.5	14 38 56.26
12	224	139 27 14.3	26 57.2	144.04	+ 0.14	0.0056320	33.2	14 35 0.35
13	225	140 24 51.8	24 34.6	144.08	0.00	0.0055517	−33.8	14 31 4.44
14	226	141 22 30.3	22 12.9	144.13	− 0.14	0.0054699	34.4	14 27 8.53
15	227	142 20 9.8	19 52.3	144.17	0.27	0.0053868	34.9	14 23 12.62
16	228	143 17 50.3	17 32.7	144.21	− 0.38	0.0053024	−35.4	14 19 16.71
17	229	144 15 31.9	15 14.2	144.26	0.47	0.0052169	35.8	14 15 20.80
18	230	145 13 14.8	12 57.0	144.31	0.53	0.0051305	36.2	14 11 24.89
19	231	146 10 59.0	10 41.0	144.37	− 0.56	0.0050432	−36.6	14 7 28.98
20	232	147 8 44.6	8 26.4	144.43	0.57	0.0049549	36.9	14 3 33.07
21	233	148 6 31.6	6 13.3	144.49	0.55	0.0048658	37.3	13 59 37.16
22	234	149 4 20.1	4 1.7	144.56	− 0.49	0.0047758	−37.7	13 55 41.25
23	235	150 2 10.3	1 51.8	144.63	0.40	0.0046849	38.1	13 51 45.35
24	236	150 60 2.2	59 43.5	144.70	0.29	0.0045931	38.5	13 47 49.44
25	237	151 57 55.8	57 37.0	144.77	− 0.17	0.0045003	−38.9	13 43 53.53
26	238	152 55 51.2	55 32.3	144.85	− 0.05	0.0044063	39.4	13 39 57.62
27	239	153 53 48.4	53 29.4	144.92	+ 0.08	0.0043110	39.9	13 36 1.72
28	240	154 51 47.5	51 28.4	145.00	+ 0.20	0.0042144	−40.5	13 32 5.81
29	241	155 49 48.5	49 29.2	145.08	0.31	0.0041165	41.1	13 28 9.90
30	242	156 47 51.4	47 32.0	145.16	0.41	0.0040171	41.7	13 24 13.99
31	243	157 45 56.1	45 36.6	145.24	0.49	0.0039160	42.5	13 20 18.08
32	244	158 44 2.7	43 43.1	145.31	+ 0.54	0.0038131	−43.3	13 16 22.17

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 19.6	15 15.5	56 8.2	−1.29	55 53.1	−1.24	22 17.8	2.24	26.3
2	15 11.5	15 7.8	55 38.7	1.18	55 25.0	1.11	23 10.9	2.16	27.3
3	15 4.3	15 1.0	55 12.1	1.05	54 59.9	0.98	δ		28.3
4	14 57.9	14 55.1	54 48.6	−0.91	54 38.2	−0.83	0 1.3	2.04	29.3
5	14 52.5	14 50.3	54 28.9	0.74	54 20.7	0.64	0 48.7	1.91	0.8
6	14 48.4	14 46 9	54 13.8	0.52	54 8.2	0.41	1 33.2	1.80	1.8
7	14 45.8	14 45.1	54 4.1	−0.27	54 1.7	−0.13	2 15.1	1.71	2.8
8	14 45.0	14 45.3	54 1.1	+0.03	54 2.4	+0.20	2 55.5	1.67	3.8
9	14 46.2	14 47.8	54 5.8	0.38	54 11.4	0.56	3 35.1	1.66	4.8
10	14 49.9	14 52.7	54 19.2	+0.76	54 29.4	+0.95	4 15.0	1.69	5.8
11	14 56.1	15 0.2	54 42.0	1.16	54 57.0	1.35	4 56.2	1.77	6.8
12	15 4.9	15 10.3	55 14.3	1.55	55 34.0	1.74	5 40.0	1.90	7.8
13	15 16.2	15 22.7	55 55.9	+1.91	56 19.8	+2.07	6 27.4	2.06	8.8
14	15 29.7	15 37.1	56 45.4	2.20	57 12.4	2.30	7 19.1	2.25	9.8
15	15 44.7	15 52.5	57 40.5	2.36	58 9.1	2.39	8 15.3	2.42	10.8
16	16 0.3	16 7.9	58 37.7	+2.36	59 5.6	+2.28	9 15.2	2.53	11.8
17	16 15.1	16 21.8	59 32.2	2.14	59 56.8	1.94	10 16.9	2.56	12.8
18	16 27.8	16 32.8	60 18.7	1.69	60 37.3	1.40	11 18.1	2.50	13.8
19	16 36.9	16 39.7	60 52.1	+1.05	61 2.5	+0.68	12 17.0	2.39	14.8
20	16 41.3	16 41.6	61 8.3	+0.30	61 9.5	−0.11	13 12.8	2.27	15.8
21	16 40.6	16 38.4	61 5.9	−0.49	60 57.8	0.85	14 6.0	2.18	16.8
22	16 35.1	16 30.9	60 45.7	−1.16	60 30.0	−1.44	14 57.3	2.13	17.8
23	16 25.8	16 20.0	60 11.3	1.67	59 50.1	1.84	15 48.1	2.12	18.8
24	16 13.8	16 7.2	59 27.2	1.97	59 3.0	2.05	16 39.2	2.15	19.8
25	16 0.4	15 53.6	58 38.2	−2.08	58 13.2	−2.07	17 31.4	2.20	20.8
26	15 46.9	15 40.4	57 48.6	2.03	57 24.6	1.97	18 24.9	2.25	21.8
27	15 34.1	15 28.1	57 1.5	1.88	56 39.5	1.72	19 19.5	2.27	22.8
28	15 22.5	15 17.2	56 18.8	−1.67	55 59.5	−1.55	20 14.0	2.24	23.8
29	15 12.4	15 7.9	55 41.7	1.43	55 25.4	1.30	21 7.2	2.17	24.8
30	15 3.9	15 0.2	55 10.5	1.19	54 57.0	1.07	21 58.0	2.06	25.8
31	14 56.9	14 54.0	54 45.0	0.95	54 34.3	0.84	22 46.0	1.94	26.8
32	14 51.5	14 49.3	54 25.0	−0.73	54 16.9	−0.62	23 31.1	1.82	27.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					**MONDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 8 21.02	2.3603	N.25 51 32.4	2.012	0	7 59 41.59	2.2477	N.24 45 37.4	4.584
1	6 10 42.63	2.3600	25 53 28.8	1.867	1	8 1 56.33	2.2436	24 40 58.6	4.707
2	6 13 4.22	2.3596	25 55 16.4	1.722	2	8 4 10.82	2.2394	24 36 12.5	4.829
3	6 15 25.78	2.3591	25 56 55.4	1.577	3	8 6 25.05	2.2351	24 31 19.1	4.950
4	6 17 47.31	2.3585	25 58 25.7	1.432	4	8 8 39.03	2.2308	24 26 18.5	5.071
5	6 20 8.80	2.3578	25 59 47.3	1.287	5	8 10 52.75	2.2266	24 21 10.6	5.191
6	6 22 30.25	2.3571	26 1 0.2	1.143	6	8 13 6.22	2.2223	24 15 55.6	5.309
7	6 24 51.65	2.3562	26 2 4.5	0.999	7	8 15 19.42	2.2178	24 10 33.5	5.427
8	6 27 12.99	2.3552	26 3 0.1	0.855	8	8 17 32.35	2.2133	24 5 4.3	5.545
9	6 29 34.27	2.3542	26 3 47.1	0.711	9	8 19 45.02	2.2089	23 59 28.1	5.661
10	6 31 55.49	2.3530	26 4 25.4	0.567	10	8 21 57.42	2.2043	23 53 45.0	5.776
11	6 34 16.63	2.3517	26 4 55.1	0.423	11	8 24 9.54	2.1997	23 47 55.0	5.890
12	6 36 37.69	2.3504	26 5 16.2	0.280	12	8 26 21.38	2.1950	23 41 58.2	6.003
13	6 38 58.67	2.3490	26 5 28.7	+ 0.137	13	8 28 32.94	2.1904	23 35 54.6	6.116
14	6 41 19.57	2.3475	26 5 32.6	− 0.006	14	8 30 44.23	2.1858	23 29 44.2	6.228
15	6 43 40.37	2.3459	26 5 27.9	0.149	15	8 32 55.24	2.1812	23 23 27.2	6.338
16	6 46 1.07	2.3442	26 5 14.7	0.291	16	8 35 5.97	2.1764	23 17 3.6	6.448
17	6 48 21.67	2.3425	26 4 53.0	0.434	17	8 37 16.41	2.1716	23 10 33.4	6.558
18	6 50 42.17	2.3406	26 4 22.7	0.576	18	8 39 26.56	2.1668	23 3 56.6	6.667
19	6 53 2.55	2.3386	26 3 43.9	0.717	19	8 41 36.42	2.1620	22 57 13.4	6.773
20	6 55 22.80	2.3365	26 2 56.7	0.857	20	8 43 46.00	2.1572	22 50 23.8	6.879
21	6 57 42.93	2.3344	26 2 1.1	0.997	21	8 45 55.29	2.1524	22 43 27.9	6.984
22	7 0 2.93	2.3322	26 0 57.0	1.138	22	8 48 4.29	2.1475	22 36 25.7	7.088
23	7 2 22.80	2.3300	N.25 59 44.5	1.278	23	8 50 12.99	2.1426	N.22 29 17.3	7.191
	SUNDAY 2.					**TUESDAY 4.**			
0	7 4 42.53	2.3277	N.25 58 23.6	1.417	0	8 52 21.40	2.1377	N.22 22 2.8	7.293
1	7 7 2.12	2.3252	25 56 54.4	1.556	1	8 54 29.52	2.1328	22 14 42.2	7.394
2	7 9 21.55	2.3225	25 55 16.9	1.694	2	8 56 37.34	2.1279	22 7 15.5	7.495
3	7 11 40.82	2.3198	25 53 31.1	1.832	3	8 58 44.87	2.1230	21 59 42.8	7.594
4	7 13 59.93	2.3171	25 51 37.0	1.970	4	9 0 52.10	2.1180	21 52 4.2	7.693
5	7 16 18.88	2.3144	25 49 34.7	2.107	5	9 2 59.03	2.1131	21 44 19.7	7.790
6	7 18 37.66	2.3116	25 47 24.2	2.243	6	9 5 5.67	2.1082	21 36 29.4	7.887
7	7 20 56.27	2.3086	25 45 5.5	2.379	7	9 7 12.01	2.1032	21 28 33.3	7.982
8	7 23 14.69	2.3055	25 42 38.7	2.514	8	9 9 18.05	2.0982	21 20 31.6	8.075
9	7 25 32.93	2.3024	25 40 3.9	2.648	9	9 11 23.80	2.0933	21 12 24.3	8.168
10	7 27 50.98	2.2992	25 37 21.0	2.782	10	9 13 29.25	2.0883	21 4 11.4	8.261
11	7 30 8.84	2.2960	25 34 30.1	2.915	11	9 15 34.40	2.0834	20 55 52.9	8.353
12	7 32 26.50	2.2927	25 31 31.2	3.047	12	9 17 39.26	2.0785	20 47 29.0	8.443
13	7 34 43.96	2.2893	25 28 24.4	3.179	13	9 19 43.82	2.0735	20 38 59.7	8.532
14	7 37 1.21	2.2858	25 25 9.7	3.311	14	9 21 48.08	2.0685	20 30 25.1	8.621
15	7 39 18.25	2.2823	25 21 47.1	3.442	15	9 23 52.04	2.0636	20 21 45.2	8.708
16	7 41 35.08	2.2788	25 18 16.7	3.572	16	9 25 55.71	2.0587	20 13 0.1	8.795
17	7 43 51.70	2.2752	25 14 38.5	3.701	17	9 27 59.09	2.0538	20 4 9.8	8.881
18	7 46 8.10	2.2714	25 10 52.6	3.829	18	9 30 2.17	2.0489	19 55 14.4	8.965
19	7 48 24.27	2.2676	25 6 59.0	3.956	19	9 32 4.96	2.0441	19 46 14.0	9.048
20	7 50 40.21	2.2637	25 2 57.8	4.083	20	9 34 7.46	2.0392	19 37 8.6	9.131
21	7 52 55.91	2.2598	24 58 49.0	4.210	21	9 36 9.66	2.0343	19 27 58.3	9.212
22	7 55 11.38	2.2558	24 54 32.6	4.336	22	9 38 11.57	2.0294	19 18 43.1	9.292
23	7 57 26.61	2.2518	24 50 8.7	4.460	23	9 40 13.19	2.0246	19 9 23.1	9.372
24	7 59 41.59	2.2477	N.24 45 37.4	4.584	24	9 42 14.53	2.0199	N.18 59 58.4	9.451

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 42 14.53	2.0199	N.18 59 58.4	9.451
1	9 44 15.58	2.0151	18 50 29.0	9.528
2	9 46 16.34	2.0103	18 40 55.0	9.605
3	9 48 16.82	2.0056	18 31 16.4	9.681
4	9 50 17.01	2.0008	18 21 33.3	9.756
5	9 52 16.92	1.9962	18 11 45.7	9.830
6	9 54 16.55	1.9915	18 1 53.7	9.902
7	9 56 15.90	1.9868	17 51 57.4	9.974
8	9 58 14.97	1.9822	17 41 56.8	10.045
9	10 0 13.77	1.9777	17 31 52.0	10.115
10	10 2 12.30	1.9732	17 21 43.0	10.184
11	10 4 10.56	1.9687	17 11 29.9	10.252
12	10 6 8.54	1.9642	17 1 12.7	10.320
13	10 8 6.26	1.9597	16 50 51.5	10.386
14	10 10 3.71	1.9553	16 40 26.4	10.450
15	10 12 0.90	1.9509	16 29 57.5	10.514
16	10 13 57.82	1.9466	16 19 24.7	10.578
17	10 15 54.49	1.9423	16 8 48.1	10.641
18	10 17 50.90	1.9381	15 58 7.8	10.702
19	10 19 47.06	1.9338	15 47 23.9	10.762
20	10 21 42.96	1.9296	15 36 36.3	10.822
21	10 23 38.61	1.9254	15 25 45.2	10.881
22	10 25 34.01	1.9213	15 14 50.6	10.939
23	10 27 29.17	1.9173	N.15 3 52.5	10.997

THURSDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 29 24.09	1.9133	N.14 52 51.0	11.053
1	10 31 18.77	1.9093	14 41 46.2	11.108
2	10 33 13.21	1.9053	14 30 38.1	11.162
3	10 35 7.41	1.9014	14 19 26.8	11.215
4	10 37 1.38	1.8976	14 8 12.3	11.268
5	10 38 55.13	1.8939	13 56 54.7	11.320
6	10 40 48.65	1.8901	13 45 33.9	11.372
7	10 42 41.94	1.8863	13 34 10.1	11.421
8	10 44 35.01	1.8827	13 22 43.4	11.470
9	10 46 27.87	1.8792	13 11 13.7	11.519
10	10 48 20.51	1.8756	12 59 41.1	11.566
11	10 50 12.94	1.8721	12 48 5.8	11.612
12	10 52 5.16	1.8687	12 36 27.7	11.658
13	10 53 57.18	1.8652	12 24 46.8	11.703
14	10 55 48.99	1.8618	12 13 3.3	11.747
15	10 57 40.60	1.8586	12 1 17.2	11.790
16	10 59 32.02	1.8553	11 49 28.5	11.833
17	11 1 23.24	1.8521	11 37 37.2	11.875
18	11 3 14.27	1.8489	11 25 43.5	11.915
19	11 5 5.11	1.8458	11 13 47.4	11.955
20	11 6 55.77	1.8428	11 1 48.9	11.995
21	11 8 46.25	1.8398	10 49 48.0	12.034
22	11 10 36.55	1.8369	10 37 44.8	12.072
23	11 12 26.68	1.8341	10 25 39.4	12.108
24	11 14 16.64	1.8313	N.10 13 31.9	12.144

FRIDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 14 16.64	1.8313	N.10 13 31.9	12.144
1	11 16 6.43	1.8285	10 1 22.2	12.179
2	11 17 56.06	1.8257	9 49 10.4	12.214
3	11 19 45.52	1.8231	9 36 56.5	12.248
4	11 21 34.83	1.8206	9 24 40.6	12.281
5	11 23 23.99	1.8180	9 12 22.8	12.313
6	11 25 12.99	1.8155	9 0 3.1	12.344
7	11 27 1.85	1.8131	8 47 41.5	12.375
8	11 28 50.57	1.8107	8 35 18.1	12.406
9	11 30 39.14	1.8084	8 22 52.8	12.436
10	11 32 27.58	1.8062	8 10 25.8	12.464
11	11 34 15.89	1.8041	7 57 57.2	12.491
12	11 36 4.07	1.8020	7 45 26.9	12.518
13	11 37 52.13	1.7999	7 32 55.0	12.544
14	11 39 40.06	1.7978	7 20 21.6	12.570
15	11 41 27.87	1.7959	7 7 46.6	12.596
16	11 43 15.57	1.7941	6 55 10.1	12.620
17	11 45 3.16	1.7923	6 42 32.2	12.643
18	11 46 50.64	1.7906	6 29 53.0	12.665
19	11 48 38.02	1.7888	6 17 12.4	12.687
20	11 50 25.30	1.7872	6 4 30.5	12.709
21	11 52 12.48	1.7856	5 51 47.3	12.730
22	11 53 59.57	1.7842	5 39 2.9	12.750
23	11 55 46.58	1.7827	N. 5 26 17.3	12.769

SATURDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 57 33.50	1.7813	N. 5 13 30.6	12.788
1	11 59 20.34	1.7800	5 0 42.8	12.806
2	12 1 7.10	1.7788	4 47 53.9	12.823
3	12 2 53.79	1.7776	4 35 4.0	12.839
4	12 4 40.41	1.7765	4 22 13.2	12.855
5	12 6 26.97	1.7754	4 9 21.4	12.871
6	12 8 13.46	1.7743	3 56 28.7	12.886
7	12 9 59.89	1.7734	3 43 35.1	12.899
8	12 11 46.27	1.7726	3 30 40.8	12.912
9	12 13 32.61	1.7719	3 17 45.7	12.924
10	12 15 18.90	1.7712	3 4 49.9	12.936
11	12 17 5.15	1.7704	2 51 53.4	12.947
12	12 18 51.35	1.7698	2 38 56.2	12.958
13	12 20 37.52	1.7693	2 25 58.4	12.968
14	12 22 23.66	1.7688	2 13 0.1	12.977
15	12 24 9.78	1.7685	2 0 1.2	12.986
16	12 25 55.88	1.7681	1 47 1.8	12.993
17	12 27 41.96	1.7678	1 34 2.0	13.000
18	12 29 28.02	1.7676	1 21 1.8	13.007
19	12 31 14.07	1.7675	1 8 1.2	13.013
20	12 33 0.12	1.7675	0 55 0.3	13.018
21	12 34 46.17	1.7675	0 41 59.0	13.023
22	12 36 32.22	1.7675	0 28 57.5	13.027
23	12 38 18.27	1.7676	0 15 55.8	13.030
24	12 40 4.33	1.7678	N. 0 2 53.9	13.033

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 40 4.33	1.7678	N. 0 2 53.9	13.033
1	12 41 50.40	1.7681	S. 0 10 8.2	13.035
2	12 43 36.50	1.7685	0 23 10.3	13.036
3	12 45 22.62	1.7689	0 36 12.5	13.037
4	12 47 8.77	1.7694	0 49 14.7	13.037
5	12 48 54.95	1.7699	1 2 16.9	13.036
6	12 50 41.16	1.7705	1 15 19.0	13.035
7	12 52 27.41	1.7712	1 28 21.1	13.033
8	12 54 13.71	1.7720	1 41 23.0	13.030
9	12 56 0.05	1.7728	1 54 24.7	13.027
10	12 57 46.44	1.7737	2 7 26.2	13.023
11	12 59 32.89	1.7747	2 20 27.4	13.018
12	13 1 19.40	1.7757	2 33 28.4	13.013
13	13 3 5.98	1.7768	2 46 29.0	13.007
14	13 4 52.62	1.7779	2 59 29.2	13.001
15	13 6 39.33	1.7792	3 12 29.1	12.994
16	13 8 26.12	1.7805	3 25 28.5	12.986
17	13 10 12.99	1.7818	3 38 27.4	12.977
18	13 11 59.94	1.7832	3 51 25.8	12.968
19	13 13 46.98	1.7848	4 4 23.6	12.958
20	13 15 34.12	1.7865	4 17 20.8	12.948
21	13 17 21.36	1.7882	4 30 17.4	12.937
22	13 19 8.70	1.7899	4 43 13.3	12.925
23	13 20 56.14	1.7916	S. 4 56 8.4	12.912

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 22 43.69	1.7934	S. 5 9 2.7	12.898
1	13 24 31.35	1.7954	5 21 56.2	12.885
2	13 26 19.14	1.7975	5 34 48.9	12.871
3	13 28 7.05	1.7996	5 47 40.7	12.855
4	13 29 55.09	1.8017	6 0 31.5	12.839
5	13 31 43.26	1.8039	6 13 21.3	12.823
6	13 33 31.56	1.8062	6 26 10.2	12.806
7	13 35 20.00	1.8086	6 38 58.0	12.787
8	13 37 8.59	1.8111	6 51 44.6	12.767
9	13 38 57.33	1.8137	7 4 30.1	12.748
10	13 40 46.23	1.8162	7 17 14.4	12.728
11	13 42 35.28	1.8188	7 29 57.5	12.707
12	13 44 24.49	1.8216	7 42 39.3	12.686
13	13 46 13.87	1.8244	7 55 19.8	12.663
14	13 48 3.42	1.8272	8 7 58.9	12.640
15	13 49 53.14	1.8302	8 20 36.6	12.616
16	13 51 43.04	1.8332	8 33 12.8	12.591
17	13 53 33.13	1.8363	8 45 47.5	12.566
18	13 55 23.40	1.8395	8 58 20.7	12.540
19	13 57 13.87	1.8427	9 10 52.3	12.513
20	13 59 4.53	1.8460	9 23 22.2	12.485
21	14 0 55.39	1.8493	9 35 50.5	12.457
22	14 2 46.45	1.8528	9 48 17.0	12.427
23	14 4 37.73	1.8564	10 0 41.7	12.397
24	14 6 29.22	1.8600	S. 10 13 4.6	12.366

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 6 29.22	1.8600	S. 10 13 4.6	12.366
1	14 8 20.93	1.8637	10 25 25.6	12.334
2	14 10 12.86	1.8674	10 37 44.7	12.302
3	14 12 5.01	1.8712	10 50 1.8	12.268
4	14 13 57.40	1.8751	11 2 16.9	12.234
5	14 15 50.02	1.8790	11 14 29.9	12.199
6	14 17 42.88	1.8830	11 26 40.8	12.163
7	14 19 35.98	1.8871	11 38 49.5	12.127
8	14 21 29.33	1.8913	11 50 56.0	12.089
9	14 23 22.94	1.8956	12 3 0.2	12.050
10	14 25 16.80	1.8999	12 15 2.0	12.011
11	14 27 10.92	1.9042	12 27 1.5	11.972
12	14 29 5.31	1.9087	12 38 58.6	11.931
13	14 30 59.97	1.9132	12 50 53.2	11.888
14	14 32 54.90	1.9177	13 2 45.2	11.845
15	14 34 50.10	1.9223	13 14 34.6	11.802
16	14 36 45.58	1.9271	13 26 21.4	11.757
17	14 38 41.35	1.9319	13 38 5.5	11.712
18	14 40 37.41	1.9367	13 49 46.8	11.665
19	14 42 33.76	1.9417	14 1 25.3	11.617
20	14 44 30.41	1.9467	14 13 0.9	11.569
21	14 46 27.36	1.9518	14 24 33.6	11.520
22	14 48 24.62	1.9569	14 36 3.3	11.470
23	14 50 22.19	1.9621	S. 14 47 30.0	11.419

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 52 20.07	1.9673	S. 14 58 53.6	11.367
1	14 54 18.27	1.9727	15 10 14.0	11.313
2	14 56 16.79	1.9781	15 21 31.2	11.259
3	14 58 15.64	1.9835	15 32 45.1	11.203
4	15 0 14.81	1.9890	15 43 55.6	11.147
5	15 2 14.32	1.9946	15 55 2.7	11.090
6	15 4 14.16	2.0002	16 6 6.4	11.032
7	15 6 14.34	2.0059	16 17 6.5	10.972
8	15 8 14.87	2.0117	16 28 3.0	10.912
9	15 10 15.74	2.0175	16 38 55.9	10.851
10	15 12 16.97	2.0234	16 49 45.1	10.788
11	15 14 18.55	2.0293	17 0 30.4	10.723
12	15 16 20.49	2.0353	17 11 11.8	10.658
13	15 18 22.79	2.0414	17 21 49.3	10.593
14	15 20 25.46	2.0475	17 32 22.9	10.526
15	15 22 28.49	2.0537	17 42 52.4	10.457
16	15 24 31.90	2.0599	17 53 17.8	10.388
17	15 26 35.68	2.0662	18 3 39.0	10.317
18	15 28 39.84	2.0725	18 13 55.9	10.246
19	15 30 44.38	2.0789	18 24 8.5	10.173
20	15 32 49.31	2.0853	18 34 16.7	10.099
21	15 34 54.62	2.0917	18 44 20.3	10.023
22	15 37 0.32	2.0983	18 54 19.4	9.947
23	15 39 6.42	2.1050	19 4 13.9	9.870
24	15 41 12.92	2.1116	S. 19 14 3.8	9.792

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 41 12.92	2.1116	S. 19 14 3.8	9.793
1	15 43 19.81	2.1183	19 23 48.9	9.711
2	15 45 27.10	2.1249	19 33 29.1	9.629
3	15 47 34.80	2.1317	19 43 4.4	9.547
4	15 49 42.91	2.1385	19 52 34.7	9.463
5	15 51 51.42	2.1453	20 1 59.9	9.378
6	15 54 0.34	2.1522	20 11 20.0	9.292
7	15 56 9.68	2.1591	20 20 34.9	9.204
8	15 58 19.43	2.1660	20 29 44.5	9.114
9	16 0 29.60	2.1729	20 38 48.6	9.023
10	16 2 40.18	2.1799	20 47 47.3	8.932
11	16 4 51.19	2.1870	20 56 40.5	8.840
12	16 7 2.62	2.1940	21 5 28.1	8.746
13	16 9 14.47	2.2011	21 14 10.0	8.650
14	16 11 26.75	2.2082	21 22 46.1	8.553
15	16 13 39.46	2.2154	21 31 16.4	8.456
16	16 15 52.60	2.2225	21 39 40.8	8.356
17	16 18 6.16	2.2296	21 47 59.1	8.254
18	16 20 20.15	2.2368	21 56 11.3	8.152
19	16 22 34.57	2.2440	22 4 17.4	8.049
20	16 24 49.43	2.2512	22 12 17.2	7.943
21	16 27 4.72	2.2584	22 20 10.6	7.837
22	16 29 20.44	2.2656	22 27 57.6	7.729
23	16 31 36.59	2.2728	S. 22 35 38.1	7.620

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 33 53.18	2.2801	S. 22 43 12.0	7.509
1	16 36 10.20	2.2873	22 50 39.2	7.397
2	16 38 27.66	2.2946	22 57 59.7	7.284
3	16 40 45.55	2.3018	23 5 13.3	7.169
4	16 43 3.87	2.3089	23 12 20.0	7.053
5	16 45 22.62	2.3161	23 19 19.7	6.936
6	16 47 41.81	2.3233	23 26 12.3	6.817
7	16 50 1.42	2.3305	23 32 57.7	6.696
8	16 52 21.47	2.3377	23 39 35.8	6.574
9	16 54 41.95	2.3449	23 46 6.6	6.452
10	16 57 2.86	2.3520	23 52 30.0	6.327
11	16 59 24.19	2.3591	23 58 45.8	6.200
12	17 1 45.95	2.3662	24 4 54.0	6.072
13	17 4 8.13	2.3732	24 10 54.5	5.943
14	17 6 30.73	2.3802	24 16 47.2	5.813
15	17 8 53.75	2.3872	24 22 32.1	5.682
16	17 11 17.19	2.3941	24 28 9.1	5.549
17	17 13 41.04	2.4009	24 33 38.0	5.414
18	17 16 5.30	2.4078	24 38 58.8	5.278
19	17 18 29.97	2.4146	24 44 11.4	5.141
20	17 20 55.05	2.4213	24 49 15.7	5.002
21	17 23 20.53	2.4280	24 54 11.7	4.863
22	17 25 46.41	2.4347	24 58 59.3	4.722
23	17 28 12.69	2.4412	25 3 38.3	4.578
24	17 30 39.36	2.4477	S. 25 8 8.7	4.434

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 30 39.36	2.4477	S. 25 8 8.7	4.434
1	17 33 6.42	2.4542	25 12 30.4	4.289
2	17 35 33.86	2.4605	25 16 43.4	4.143
3	17 38 1.68	2.4668	25 20 47.6	3.995
4	17 40 29.88	2.4731	25 24 42.8	3.845
5	17 42 58.45	2.4792	25 28 29.0	3.695
6	17 45 27.39	2.4853	25 32 6.2	3.543
7	17 47 56.69	2.4913	25 35 34.2	3.390
8	17 50 26.35	2.4971	25 38 53.0	3.237
9	17 52 56.35	2.5029	25 42 2.6	3.082
10	17 55 26.70	2.5087	25 45 2.8	2.924
11	17 57 57.40	2.5144	25 47 53.5	2.766
12	18 0 28.43	2.5199	25 50 34.7	2.607
13	18 2 59.79	2.5253	25 53 6.3	2.447
14	18 5 31.47	2.5307	25 55 28.3	2.286
15	18 8 3.47	2.5359	25 57 40.6	2.123
16	18 10 35.78	2.5411	25 59 43.1	1.960
17	18 13 8.40	2.5461	26 1 35.8	1.796
18	18 15 41.31	2.5509	26 3 18.6	1.630
19	18 18 14.51	2.5557	26 4 51.4	1.463
20	18 20 48.00	2.5604	26 6 14.2	1.296
21	18 23 21.76	2.5649	26 7 27.0	1.128
22	18 25 55.79	2.5693	26 8 29.6	0.958
23	18 28 30.08	2.5737	S. 26 9 22.0	0.787

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 31 4.63	2.5778	S. 26 10 4.1	0.616
1	18 33 39.42	2.5818	26 10 35.9	0.444
2	18 36 14.45	2.5857	26 10 57.4	0.272
3	18 38 49.71	2.5895	26 11 8.6	− 0.099
4	18 41 25.19	2.5932	26 11 9.3	+ 0.076
5	18 44 0.89	2.5967	26 10 59.5	0.251
6	18 46 36.80	2.6001	26 10 39.2	0.427
7	18 49 12.90	2.6032	26 10 8.3	0.603
8	18 51 49.19	2.6063	26 9 26.8	0.780
9	18 54 25.66	2.6092	26 8 34.7	0.957
10	18 57 2.30	2.6121	26 7 31.9	1.136
11	18 59 39.11	2.6147	26 6 18.4	1.315
12	19 2 16.07	2.6172	26 4 54.1	1.494
13	19 4 53.18	2.6197	26 3 19.1	1.673
14	19 7 30.43	2.6218	26 1 33.3	1.853
15	19 10 7.80	2.6238	25 59 36.7	2.033
16	19 12 45.29	2.6257	25 57 29.3	2.214
17	19 15 22.89	2.6276	25 55 11.0	2.396
18	19 18 0.60	2.6292	25 52 41.8	2.577
19	19 20 38.40	2.6307	25 50 1.7	2.758
20	19 23 16.28	2.6320	25 47 10.8	2.939
21	19 25 54.24	2.6332	25 44 9.0	3.122
22	19 28 32.27	2.6342	25 40 56.2	3.304
23	19 31 10.35	2.6351	25 37 32.5	3.486
24	19 33 48.48	2.6358	S. 25 33 57.9	3.667

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 33 48.48	2.6358	S. 25 33 57.9	3.667
1	19 36 26.65	2.6364	25 30 12.4	3.849
2	19 39 4.85	2.6367	25 26 16.0	4.032
3	19 41 43.06	2.6369	25 22 8.6	4.214
4	19 44 21.28	2.6371	25 17 50.3	4.395
5	19 46 59.51	2.6372	25 13 21.2	4.576
6	19 49 37.74	2.6370	25 8 41.2	4.757
7	19 52 15.95	2.6366	25 3 50.3	4.938
8	19 54 54.13	2.6361	24 58 48.6	5.119
9	19 57 32.28	2.6355	24 53 36.0	5.300
10	20 0 10.39	2.6347	24 48 12.6	5.480
11	20 2 48.45	2.6339	24 42 38.4	5.659
12	20 5 26.46	2.6329	24 36 53.5	5.838
13	20 8 4.40	2.6317	24 30 57.9	6.017
14	20 10 42.26	2.6303	24 24 51.5	6.196
15	20 13 20.04	2.6289	24 18 34.4	6.373
16	20 15 57.73	2.6273	24 12 6.7	6.549
17	20 18 35.32	2.6256	24 5 28.5	6.725
18	20 21 12.80	2.6237	23 58 39.7	6.901
19	20 23 50.17	2.6218	23 51 40.4	7.075
20	20 26 27.42	2.6198	23 44 30.7	7.249
21	20 29 4.54	2.6176	23 37 10.5	7.423
22	20 31 41.53	2.6152	23 29 39.9	7.595
23	20 34 18.37	2.6127	S. 23 21 59.1	7.765

TUESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 36 55.06	2.6102	S. 23 14 8.1	7.935
1	20 39 31.60	2.6076	23 6 6.9	8.105
2	20 42 7.97	2.6048	22 57 55.5	8.274
3	20 44 44.17	2.6018	22 49 34.0	8.442
4	20 47 20.19	2.5988	22 41 2.5	8.608
5	20 49 56.03	2.5957	22 32 21.1	8.773
6	20 52 31.68	2.5925	22 23 29.8	8.937
7	20 55 7.13	2.5892	22 14 28.7	9.099
8	20 57 42.39	2.5859	22 5 17.9	9.261
9	21 0 17.44	2.5824	21 55 57.4	9.421
10	21 2 52.28	2.5788	21 46 27.4	9.579
11	21 5 26.90	2.5752	21 36 47.9	9.737
12	21 8 1.30	2.5714	21 26 58.9	9.894
13	21 10 35.47	2.5676	21 17 0.6	10.048
14	21 13 9.41	2.5637	21 6 53.1	10.202
15	21 15 43.12	2.5598	20 56 36.4	10.354
16	21 18 16.59	2.5557	20 46 10.6	10.505
17	21 20 49.81	2.5516	20 35 35.8	10.654
18	21 23 22.78	2.5474	20 24 52.1	10.802
19	21 25 55.50	2.5432	20 13 59.6	10.948
20	21 28 27.97	2.5390	20 2 58.4	11.092
21	21 31 0.18	2.5347	19 51 48.6	11.234
22	21 33 32.13	2.5302	19 40 30.3	11.375
23	21 36 3.81	2.5257	19 29 3.6	11.515
24	21 38 35.22	2.5212	S. 19 17 28.5	11.653

WEDNESDAY 19.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 38 35.22	2.5212	S. 19 17 28.5	11.653
1	21 41 6.36	2.5167	19 5 45.2	11.789
2	21 43 37.23	2.5122	18 53 53.8	11.923
3	21 46 7.83	2.5077	18 41 54.4	12.056
4	21 48 38.15	2.5030	18 29 47.1	12.187
5	21 51 8.19	2.4984	18 17 32.0	12.317
6	21 53 37.95	2.4937	18 5 9.1	12.444
7	21 56 7.43	2.4889	17 52 38.7	12.569
8	21 58 36.62	2.4842	17 40 0.8	12.693
9	22 1 5.53	2.4794	17 27 15.5	12.816
10	22 3 34.15	2.4746	17 14 22.9	12.936
11	22 6 2.48	2.4698	17 1 23.2	13.053
12	22 8 30.53	2.4651	16 48 16.5	13.170
13	22 10 58.29	2.4603	16 35 2.8	13.284
14	22 13 25.76	2.4554	16 21 42.4	13.396
15	22 15 52.94	2.4506	16 8 15.3	13.507
16	22 18 19.83	2.4457	15 54 41.6	13.616
17	22 20 46.43	2.4409	15 41 1.4	13.723
18	22 23 12.74	2.4361	15 27 14.9	13.828
19	22 25 38.76	2.4313	15 13 22.1	13.930
20	22 28 4.50	2.4266	14 59 23.3	14.030
21	22 30 29.95	2.4218	14 45 18.5	14.129
22	22 32 55.11	2.4170	14 31 7.8	14.226
23	22 35 19.99	2.4122	S. 14 16 51.4	14.320

THURSDAY 20.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 37 44.58	2.4075	S. 14 2 29.4	14.412
1	22 40 8.89	2.4028	13 48 1.9	14.503
2	22 42 32.92	2.3981	13 33 29.0	14.592
3	22 44 56.66	2.3934	13 18 50.8	14.679
4	22 47 20.12	2.3888	13 4 7.5	14.763
5	22 49 43.31	2.3842	12 49 19.2	14.846
6	22 52 6.22	2.3796	12 34 25.9	14.927
7	22 54 28.86	2.3751	12 19 27.9	15.005
8	22 56 51.23	2.3705	12 4 25.3	15.082
9	22 59 13.32	2.3660	11 49 18.1	15.157
10	23 1 35.15	2.3616	11 34 6.5	15.229
11	23 3 56.71	2.3572	11 18 50.6	15.299
12	23 6 18.01	2.3528	11 3 30.6	15.367
13	23 8 39.05	2.3485	10 48 6.5	15.433
14	23 10 59.83	2.3443	10 32 38.6	15.497
15	23 13 20.36	2.3401	10 17 6.9	15.559
16	23 15 40.64	2.3359	10 1 31.5	15.619
17	23 18 0.67	2.3317	9 45 52.6	15.678
18	23 20 20.45	2.3277	9 30 10.2	15.734
19	23 22 39.99	2.3237	9 14 24.5	15.787
20	23 24 59.29	2.3197	8 58 35.7	15.839
21	23 27 18.35	2.3157	8 42 43.8	15.889
22	23 29 37.17	2.3118	8 26 49.0	15.937
23	23 31 55.77	2.3081	8 10 51.4	15.983
24	23 34 14.14	2.3044	S. 7 54 51.1	16.027

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 34 14.14	2.3044	S. 7 54 51.1	16.027
1	23 36 32.29	2.3007	7 38 48.2	16.068
2	23 38 50.22	2.2970	7 22 42.9	16.107
3	23 41 7.93	2.2934	7 6 35.3	16.145
4	23 43 25.43	2.2899	6 50 25.5	16.181
5	23 45 42.72	2.2865	6 34 13.6	16.215
6	23 47 59.81	2.2832	6 17 59.7	16.247
7	23 50 16.70	2.2798	6 1 44.0	16.276
8	23 52 33.39	2.2765	5 45 26.6	16.304
9	23 54 49.88	2.2732	5 29 7.5	16.330
10	23 57 6.18	2.2702	5 12 47.0	16.353
11	23 59 22.30	2.2672	4 56 25.1	16.376
12	0 1 38.24	2.2642	4 40 1.9	16.396
13	0 3 54.00	2.2613	4 23 37.6	16.413
14	0 6 9.59	2.2584	4 7 12.3	16.429
15	0 8 25.01	2.2556	3 50 46.1	16.444
16	0 10 40.26	2.2529	3 34 19.0	16.457
17	0 12 55.36	2.2503	3 17 51.3	16.467
18	0 15 10.30	2.2477	3 1 23.0	16.476
19	0 17 25.09	2.2452	2 44 54.2	16.482
20	0 19 39.73	2.2427	2 28 25.1	16.487
21	0 21 54.22	2.2404	2 11 55.8	16.489
22	0 24 8.58	2.2382	1 55 26.4	16.490
23	0 26 22.80	2.2359	S. 1 38 57.0	16.490

SATURDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 28 36.89	2.2337	S. 1 22 27.6	16.488
1	0 30 50.85	2.2317	1 5 58.5	16.483
2	0 33 4.70	2.2296	0 49 29.7	16.477
3	0 35 18.43	2.2278	0 33 1.3	16.469
4	0 37 32.04	2.2260	0 16 33.4	16.459
5	0 39 45.55	2.2242	S. 0 0 6.2	16.447
6	0 41 58.95	2.2225	N. 0 16 20.3	16.434
7	0 44 12.25	2.2209	0 32 45.9	16.419
8	0 46 25.46	2.2193	0 49 10.6	16.402
9	0 48 38.57	2.2178	1 5 34.2	16.384
10	0 50 51.60	2.2165	1 21 56.7	16.364
11	0 53 4.55	2.2152	1 38 17.9	16.342
12	0 55 17.42	2.2139	1 54 37.7	16.318
13	0 57 30.22	2.2127	2 10 56.0	16.293
14	0 59 42.95	2.2116	2 27 12.8	16.266
15	1 1 55.61	2.2105	2 43 27.9	16.237
16	1 4 8.21	2.2096	2 59 41.2	16.207
17	1 6 20.76	2.2087	3 15 52.7	16.175
18	1 8 33.26	2.2079	3 32 2.2	16.141
19	1 10 45.71	2.2072	3 48 9.6	16.106
20	1 12 58.12	2.2064	4 4 14.9	16.069
21	1 15 10.48	2.2057	4 20 17.9	16.030
22	1 17 22.81	2.2052	4 36 18.5	15.990
23	1 19 35.11	2.2048	4 52 16.7	15.950
24	1 21 47.39	2.2044	N. 5 8 12.5	15.908

SUNDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 21 47.39	2.2044	N. 5 8 12.5	15.908
1	1 23 59.64	2.2041	5 24 5.7	15.862
2	1 26 11.88	2.2038	5 39 56.0	15.814
3	1 28 24.10	2.2036	5 55 43.4	15.766
4	1 30 36.31	2.2035	6 11 27.9	15.717
5	1 32 48.52	2.2034	6 27 9.5	15.667
6	1 35 0.72	2.2034	6 42 48.0	15.615
7	1 37 12.93	2.2036	6 58 23.3	15.561
8	1 39 25.15	2.2037	7 13 55.3	15.506
9	1 41 37.37	2.2039	7 29 24.0	15.449
10	1 43 49.61	2.2042	7 44 49.2	15.391
11	1 46 1.87	2.2044	8 0 10.9	15.332
12	1 48 14.14	2.2047	8 15 29.0	15.271
13	1 50 26.44	2.2052	8 30 43.4	15.208
14	1 52 38.77	2.2058	8 45 54.0	15.144
15	1 54 51.14	2.2064	9 1 0.7	15.079
16	1 57 3.54	2.2070	9 16 3.5	15.012
17	1 59 15.98	2.2077	9 31 2.2	14.944
18	2 1 28.47	2.2085	9 45 56.8	14.875
19	2 3 41.00	2.2093	10 0 47.2	14.804
20	2 5 53.58	2.2102	10 15 33.3	14.732
21	2 8 6.22	2.2111	10 30 15.1	14.660
22	2 10 18.91	2.2121	10 44 52.5	14.585
23	2 12 31.67	2.2131	N. 10 59 25.3	14.508

MONDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 14 44.49	2.2142	N. 11 13 53.5	14.431
1	2 16 57.37	2.2154	11 28 17.0	14.352
2	2 19 10.33	2.2166	11 42 35.8	14.273
3	2 21 23.36	2.2178	11 56 49.8	14.192
4	2 23 36.46	2.2190	12 10 58.9	14.110
5	2 25 49.64	2.2204	12 25 3.0	14.026
6	2 28 2.91	2.2218	12 39 2.0	13.941
7	2 30 16.26	2.2232	12 52 55.9	13.855
8	2 32 29.70	2.2247	13 6 44.6	13.767
9	2 34 43.22	2.2261	13 20 28.0	13.679
10	2 36 56.83	2.2277	13 34 6.1	13.590
11	2 39 10.54	2.2293	13 47 38.8	13.499
12	2 41 24.35	2.2310	14 1 6.0	13.407
13	2 43 38.26	2.2327	14 14 27.7	13.314
14	2 45 52.27	2.2344	14 27 43.7	13.219
15	2 48 6.38	2.2361	14 40 54.0	13.124
16	2 50 20.60	2.2379	14 53 58.6	13.028
17	2 52 34.93	2.2397	15 6 57.4	12.930
18	2 54 49.37	2.2416	15 19 50.2	12.831
19	2 57 3.92	2.2435	15 32 37.1	12.732
20	2 59 18.59	2.2454	15 45 18.0	12.631
21	3 1 33.37	2.2473	15 57 52.8	12.529
22	3 3 48.27	2.2493	16 10 21.4	12.426
23	3 6 3.29	2.2513	16 22 43.9	12.322
24	3 8 18.43	2.2533	N. 16 35 0.1	12.217

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	3 8 18.43	2.2533	N.16 35 0.1	12.217
1	3 10 33.69	2.2553	16 47 9.9	12.110
2	3 12 49.07	2.2574	16 59 13.3	12.003
3	3 15 4.58	2.2595	17 11 10.3	11.896
4	3 17 20.21	2.2616	17 23 0.8	11.787
5	3 19 35.97	2.2637	17 34 44.7	11.676
6	3 21 51.86	2.2659	17 46 21.9	11.564
7	3 24 7.88	2.2680	17 57 52.4	11.452
8	3 26 24.02	2.2701	18 9 16.2	11.340
9	3 28 40.29	2.2723	18 20 33.2	11.226
10	3 30 56.69	2.2745	18 31 43.3	11.111
11	3 33 13.23	2.2767	18 42 46.5	10.995
12	3 35 29.90	2.2789	18 53 42.7	10.878
13	3 37 46.70	2.2811	19 4 31.9	10.761
14	3 40 3.63	2.2832	19 15 14.0	10.642
15	3 42 20.69	2.2854	19 25 49.0	10.523
16	3 44 37.88	2.2877	19 36 16.8	10.402
17	3 46 55.21	2.2899	19 46 37.3	10.281
18	3 49 12.67	2.2921	19 56 50.5	10.159
19	3 51 30.26	2.2942	20 6 56.3	10.036
20	3 53 47.98	2.2964	20 16 54.8	9.913
21	3 56 5.83	2.2986	20 26 45.9	9.789
22	3 58 23.81	2.3007	20 36 29.5	9.664
23	4 0 41.92	2.3028	N.20 46 5.5	9.538

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	4 3 0.15	2.3049	N.20 55 34.0	9.412
1	4 5 18.51	2.3071	21 4 54.9	9.284
2	4 7 37.00	2.3092	21 14 8.1	9.155
3	4 9 55.62	2.3113	21 23 13.5	9.026
4	4 12 14.36	2.3133	21 32 11.2	8.897
5	4 14 33.22	2.3153	21 41 1.1	8.767
6	4 16 52.20	2.3173	21 49 43.2	8.636
7	4 19 11.30	2.3193	21 58 17.4	8.504
8	4 21 30.52	2.3213	22 6 43.7	8.372
9	4 23 49.86	2.3232	22 15 2.1	8.240
10	4 26 9.31	2.3252	22 23 12.5	8.106
11	4 28 28.88	2.3271	22 31 14.8	7.971
12	4 30 48.56	2.3289	22 39 9.0	7.836
13	4 33 8.34	2.3306	22 46 55.1	7.701
14	4 35 28.23	2.3324	22 54 33.1	7.566
15	4 37 48.23	2.3342	23 2 3.0	7.430
16	4 40 8.33	2.3358	23 9 24.7	7.292
17	4 42 28.53	2.3374	23 16 38.1	7.154
18	4 44 48.82	2.3390	23 23 43.2	7.016
19	4 47 9.21	2.3406	23 30 40.0	6.877
20	4 49 29.69	2.3420	23 37 28.5	6.739
21	4 51 50.25	2.3434	23 44 8.7	6.600
22	4 54 10.90	2.3448	23 50 40.5	6.460
23	4 56 31.63	2.3462	23 57 3.9	6.319
24	4 58 52.44	2.3475	N.24 3 18.8	6.178

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 58 52.44	2.3475	N.24 3 18.8	6.178
1	5 1 13.33	2.3487	24 9 25.3	6.037
2	5 3 34.29	2.3499	24 15 23.3	5.896
3	5 5 55.32	2.3511	24 21 12.8	5.754
4	5 8 16.42	2.3522	24 26 53.8	5.612
5	5 10 37.58	2.3531	24 32 26.2	5.469
6	5 12 58.79	2.3540	24 37 50.1	5.326
7	5 15 20.06	2.3549	24 43 5.4	5.183
8	5 17 41.38	2.3557	24 48 12.1	5.039
9	5 20 2.75	2.3565	24 53 10.1	4.895
10	5 22 24.16	2.3572	24 57 59.5	4.752
11	5 24 45.61	2.3578	25 2 40.3	4.608
12	5 27 7.10	2.3584	25 7 12.5	4.464
13	5 29 28.62	2.3588	25 11 36.0	4.319
14	5 31 50.16	2.3592	25 15 50.8	4.174
15	5 34 11.73	2.3596	25 19 56.9	4.029
16	5 36 33.31	2.3598	25 23 54.3	3.883
17	5 38 54.91	2.3601	25 27 42.9	3.738
18	5 41 16.52	2.3603	25 31 22.9	3.594
19	5 43 38.14	2.3603	25 34 54.2	3.448
20	5 45 59.75	2.3602	25 38 16.7	3.302
21	5 48 21.36	2.3601	25 41 30.5	3.157
22	5 50 42.96	2.3599	25 44 35.5	3.011
23	5 53 4.54	2.3596	N.25 47 31.8	2.866

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 55 26.11	2.3593	N.25 50 19.4	2.720
1	5 57 47.66	2.3589	25 52 58.2	2.574
2	6 0 9.18	2.3584	25 55 28.3	2.429
3	6 2 30.66	2.3578	25 57 49.7	2.284
4	6 4 52.11	2.3572	26 0 2.4	2.138
5	6 7 13.52	2.3564	26 2 6.3	1.992
6	6 9 34.88	2.3556	26 4 1.5	1.847
7	6 11 56.19	2.3547	26 5 48.0	1.702
8	6 14 17.44	2.3537	26 7 25.8	1.557
9	6 16 38.64	2.3527	26 8 54.9	1.412
10	6 18 59.77	2.3515	26 10 15.3	1.267
11	6 21 20.82	2.3503	26 11 27.0	1.123
12	6 23 41.80	2.3490	26 12 30.1	0.979
13	6 26 2.70	2.3476	26 13 24.5	0.835
14	6 28 23.51	2.3462	26 14 10.3	0.692
15	6 30 44.24	2.3447	26 14 47.5	0.548
16	6 33 4.87	2.3430	26 15 16.0	0.404
17	6 35 25.40	2.3413	26 15 36.0	0.262
18	6 37 45.83	2.3396	26 15 47.4	+ 0.119
19	6 40 6.15	2.3377	26 15 50.3	− 0.023
20	6 42 26.35	2.3357	26 15 44.6	0.166
21	6 44 46.43	2.3337	26 15 30.4	0.307
22	6 47 6.39	2.3317	26 15 7.7	0.448
23	6 49 26.23	2.3296	26 14 36.6	0.589
24	6 51 45.93	2.3272	N.26 13 57.0	0.730

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 51 45.93	2.3272	N.26 13 57.0	0.730
1	6 54 5.49	2.3248	26 13 9.0	0.870
2	6 56 24.91	2.3225	26 12 12.6	1.009
3	6 58 44.19	2.3201	26 11 7.9	1.148
4	7 1 3.32	2.3175	26 9 54.8	1.287
5	7 3 22.29	2.3148	26 8 33.4	1.425
6	7 5 41.09	2.3120	26 7 3.8	1.562
7	7 7 59.73	2.3093	26 5 25.9	1.700
8	7 10 18.21	2.3066	26 3 39.8	1.837
9	7 12 36.52	2.3037	26 1 45.5	1.973
10	7 14 54.65	2.3006	25 59 43.0	2.109
11	7 17 12.59	2.2975	25 57 32.4	2.243
12	7 19 30.35	2.2944	25 55 13.8	2.377
13	7 21 47.92	2.2912	25 52 47.1	2.511
14	7 24 5.30	2.2880	25 50 12.4	2.645
15	7 26 22.48	2.2847	25 47 29.7	2.777
16	7 28 39.46	2.2813	25 44 39.1	2.909
17	7 30 56.24	2.2779	25 41 40.6	3.040
18	7 33 12.81	2.2744	25 38 34.3	3.171
19	7 35 29.17	2.2708	25 35 20.1	3.302
20	7 37 45.31	2.2672	25 31 58.1	3.431
21	7 40 1.23	2.2635	25 28 28.4	3.559
22	7 42 16.93	2.2597	25 24 51.0	3.686
23	7 44 32.40	2.2560	N.25 21 6.0	3.813

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 46 47.65	2.2522	N.25 17 13.4	3.940
1	7 49 2.67	2.2483	25 13 13.2	4.066
2	7 51 17.45	2.2443	25 9 5.5	4.191
3	7 53 31.99	2.2403	25 4 50.3	4.316
4	7 55 46.29	2.2363	25 0 27.6	4.439
5	7 58 0.35	2.2322	24 55 57.6	4.561
6	8 0 14.16	2.2281	24 51 20.3	4.683
7	8 2 27.72	2.2239	24 46 35.7	4.804
8	8 4 41.03	2.2197	24 41 43.8	4.925
9	8 6 54.09	2.2155	24 36 44.7	5.044
10	8 9 6.89	2.2113	24 31 38.5	5.163
11	8 11 19.44	2.2070	24 26 25.2	5.281
12	8 13 31.73	2.2026	24 21 4.8	5.398
13	8 15 43.75	2.1982	24 15 37.4	5.514
14	8 17 55.51	2.1937	24 10 3.1	5.629
15	8 20 7.00	2.1892	24 4 21.9	5.744
16	8 22 18.22	2.1847	23 58 33.8	5.857
17	8 24 29.17	2.1803	23 52 39.0	5.969
18	8 26 39.86	2.1758	23 46 37.5	6.081
19	8 28 50.27	2.1712	23 40 29.3	6.192
20	8 31 0.40	2.1666	23 34 14.4	6.303
21	8 33 10.26	2.1620	23 27 52.9	6.412
22	8 35 19.84	2.1573	23 21 24.9	6.520
23	8 37 29.14	2.1527	23 14 50.5	6.628
24	8 39 38.17	2.1481	N.23 8 9.6	6.735

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 39 38.17	2.1481	N.23 8 9.6	6.735
1	8 41 46.91	2.1434	23 1 22.3	6.840
2	8 43 55.37	2.1387	22 54 28.8	6.944
3	8 46 3.55	2.1340	22 47 29.0	7.048
4	8 48 11.45	2.1292	22 40 23.0	7.152
5	8 50 19.06	2.1245	22 33 10.8	7.254
6	8 52 26.39	2.1197	22 25 52.5	7.355
7	8 54 33.43	2.1150	22 18 28.2	7.455
8	8 56 40.19	2.1102	22 10 57.9	7.554
9	8 58 46.66	2.1054	22 3 21.7	7.652
10	9 0 52.84	2.1007	21 55 39.6	7.750
11	9 2 58.74	2.0959	21 47 51.7	7.847
12	9 5 4.35	2.0911	21 39 58.0	7.942
13	9 7 9.67	2.0863	21 31 58.6	8.037
14	9 9 14.71	2.0816	21 23 53.6	8.130
15	9 11 19.46	2.0768	21 15 43.0	8.223
16	9 13 23.93	2.0721	21 7 26.9	8.315
17	9 15 28.11	2.0673	20 59 5.2	8.407
18	9 17 32.01	2.0626	20 50 38.1	8.496
19	9 19 35.62	2.0578	20 42 5.7	8.585
20	9 21 38.95	2.0531	20 33 27.9	8.673
21	9 23 42.00	2.0484	20 24 44.9	8.760
22	9 25 44.76	2.0437	20 15 56.7	8.846
23	9 27 47.24	2.0390	N.20 7 3.4	8.931

TUESDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 29 49.44	2.0343	N.19 58 5.0	9.015

PHASES OF THE MOON.

		d	h	m
● New Moon	. August	4	5	12.2
☽ First Quarter	. . . .	12	9	11.7
○ Full Moon	. . . .	19	9	28.3
☾ Last Quarter	. . . .	26	0	9.2

		d	h
☾ Apogee	. . . August	7	22.2
☾ Perigee	. . . .	20	8.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
1	Fomalhaut	W.	118° 20′ 41″	2974	119° 51′ 26″	2991	121° 21′ 50″	3008	122° 51′ 58″	3025
	α Pegasi	W.	98 30 54	3156	99 57 56	3168	101 24 43	3183	102 51 13	3196
	α Arietis	W.	55 51 14	2890	57 23 46	2894	58 56 13	2898	60 28 35	2902
	Aldebaran	W.	24 52 17	2871	26 25 13	2866	27 58 15	2864	29 31 20	2862
	Sun	E.	37 5 19	3126	35 37 41	3139	34 10 19	3152	32 43 12	3166
2	α Arietis	W.	68 8 51	2928	69 40 34	2935	71 12 9	2941	72 43 36	2946
	Aldebaran	W.	37 16 32	2875	38 49 23	2879	40 22 9	2883	41 54 49	2889
	Sun	E.	25 31 55	3943	24 6 37	3962	22 41 41	3283	21 17 10	3308
5	Sun	W.	10 3 7	3817	11 17 52	3731	12 34 6	3665	13 51 30	3616
	Spica	E.	61 9 18	3014	59 39 23	3021	58 9 36	3027	56 39 57	3034
	Antares	E.	107 1 51	3001	105 31 40	3007	104 1 36	3013	102 31 39	3018
6	Sun	W.	20 27 43	3514	21 47 52	3506	23 8 9	3500	24 28 33	3495
	Spica	E.	49 13 45	3066	47 44 54	3073	46 16 11	3079	44 47 36	3085
	Antares	E.	95 3 35	3044	93 34 17	3049	92 5 5	3053	90 35 58	3058
7	Sun	W.	31 11 27	3488	32 32 7	3486	33 52 47	3486	35 13 27	3485
	Spica	E.	37 26 34	3117	35 58 45	3124	34 31 4	3131	33 3 32	3138
	Antares	E.	83 11 39	3076	81 43 0	3078	80 14 24	3082	78 45 52	3084
8	Sun	W.	41 56 56	3482	43 17 40	3481	44 38 25	3480	45 59 11	3480
	Antares	E.	71 23 50	3092	69 55 31	3093	68 27 13	3094	66 58 56	3094
	α Aquilæ	E.	115 40 23	4090	114 30 12	4068	113 19 39	4046	112 8 45	4027
9	Sun	W.	52 43 29	3468	54 4 29	3464	55 25 33	3462	56 46 40	3457
	Antares	E.	59 37 25	3090	58 9 3	3088	56 40 39	3086	55 12 12	3083
	α Aquilæ	E.	106 9 42	3942	104 57 5	3928	103 44 14	3915	102 31 9	3902
10	Sun	W.	63 33 33	3432	64 55 13	3425	66 17 1	3418	67 38 57	3410
	Antares	E.	47 49 2	3065	46 20 10	3061	44 51 13	3056	43 22 10	3051
	α Aquilæ	E.	96 22 43	3848	95 8 30	3838	93 54 7	3829	92 39 35	3821
11	Sun	W.	74 30 51	3368	75 53 44	3358	77 16 48	3348	78 40 4	3337
	Antares	E.	35 55 11	3022	34 25 25	3015	32 55 31	3009	31 25 29	3001
	α Aquilæ	E.	86 24 59	3787	85 9 43	3783	83 54 22	3777	82 38 56	3772
	Fomalhaut	E.	118 10 23	3212	116 44 28	3197	115 18 15	3183	113 51 45	3168
12	Sun	W.	85 39 43	3276	87 4 23	3263	88 29 18	3249	89 54 29	3235
	Spica	W.	23 3 3	3020	24 32 51	2995	26 3 10	2972	27 33 58	2950
	α Aquilæ	E.	76 20 50	3761	75 5 7	3761	73 49 24	3762	72 33 42	3765
	Fomalhaut	E.	106 34 48	3093	105 6 30	3078	103 37 54	3063	102 8 59	3048
	α Pegasi	E.	123 51 53	3497	122 31 26	3466	121 10 24	3435	119 48 47	3404
13	Sun	W.	97 4 48	3158	98 31 48	3141	99 59 8	3124	101 26 48	3106
	Spica	W.	35 14 38	2848	36 48 3	2829	38 21 53	2810	39 56 8	2792
	α Aquilæ	E.	66 16 10	3792	65 1 0	3804	63 46 2	3817	62 31 17	3832
	Fomalhaut	E.	94 39 38	2969	93 8 47	2954	91 37 36	2938	90 6 5	2921
	α Pegasi	E.	112 52 24	3267	111 27 34	3241	110 2 13	3216	108 36 23	3191
14	Sun	W.	108 50 33	3017	110 20 25	2997	111 50 41	2979	113 21 20	2961

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	Fomalhaut	W.	124° 21′ 35″	3043	125° 50′ 54″	3064	127° 19′ 48″	3084	128° 48′ 17″	3105
	α Pegasi	W.	104 17 27	3911	105 43 23	3926	107 9 2	3942	108 34 22	3959
	α Arietis	W.	62 0 51	2907	63 33 1	2912	65 5 5	2917	66 37 2	2924
	Aldebaran	W.	31 4 27	2863	32 37 33	2866	34 10 36	2868	35 43 36	2871
	Sun	E.	31 16 22	3179	29 49 48	3194	28 23 32	3209	26 57 34	3225
2	α Arietis	W.	74 14 56	2953	75 46 8	2960	77 17 11	2966	78 48 6	2973
	Aldebaran	W.	43 27 22	2894	44 59 48	2899	46 32 8	2905	48 4 20	2911
	Sun	E.	19 53 8	3336	18 29 38	3366	17 6 43	3402	15 44 29	3444
5	Sun	W.	15 9 47	3681	16 28 42	3657	17 48 3	3628	19 7 45	3594
	Spica	E.	55 10 27	3040	53 41 4	3047	52 11 50	3054	50 42 44	3060
	Antares	E.	101 1 49	3024	99 32 6	3029	98 2 29	3034	96 32 59	3039
6	Sun	W.	25 49 3	3492	27 9 36	3490	28 30 11	3488	29 50 48	3487
	Spica	E.	43 19 8	3091	41 50 48	3098	40 22 36	3104	38 54 31	3110
	Antares	E.	89 6 57	3062	87 38 1	3065	86 9 9	3069	84 40 22	3073
7	Sun	W.	36 34 8	3485	37 54 49	3484	39 15 31	3484	40 36 13	3483
	Spica	E.	31 36 8	3146	30 8 54	3154	28 41 50	3163	27 14 56	3173
	Antares	E.	77 17 23	3086	75 48 56	3088	74 20 32	3090	72 52 10	3091
8	Sun	W.	47 19 58	3478	48 40 47	3475	50 1 39	3473	51 22 33	3471
	Antares	E.	65 30 39	3094	64 2 22	3093	62 34 4	3092	61 5 45	3091
	α Aquilæ	E.	110 57 32	4006	109 46 0	3989	108 34 10	3973	107 22 4	3957
9	Sun	W.	58 7 52	3453	59 29 9	3448	60 50 31	3443	62 11 59	3438
	Antares	E.	53 43 42	3080	52 15 8	3078	50 46 31	3073	49 17 49	3069
	α Aquilæ	E.	101 17 51	3890	100 4 21	3878	98 50 39	3867	97 36 46	3857
10	Sun	W.	69 1 2	3403	70 23 15	3395	71 45 37	3386	73 8 9	3378
	Antares	E.	41 53 0	3046	40 23 44	3039	38 54 20	3034	37 24 49	3028
	α Aquilæ	E.	91 24 55	3814	90 10 7	3806	88 55 11	3799	87 40 8	3793
11	Sun	W.	80 3 33	3325	81 27 15	3314	82 51 10	3302	84 15 19	3289
	Antares	E.	29 55 18	2995	28 24 59	2989	26 54 33	2984	25 24 0	2978
	α Aquilæ	E.	81 23 25	3768	80 7 50	3766	78 52 12	3764	77 36 32	3762
	Fomalhaut	E.	112 24 57	3153	110 57 51	3138	109 30 28	3124	108 2 47	3109
12	Sun	W.	91 19 57	3220	92 45 43	3205	94 11 46	3189	95 38 8	3174
	Spica	W.	29 5 13	2929	30 36 55	2908	32 9 4	2888	33 41 38	2868
	α Aquilæ	E.	71 18 3	3768	70 2 27	3771	68 46 55	3777	67 31 29	3784
	Fomalhaut	E.	100 39 46	3032	99 10 13	3017	97 40 21	3001	96 10 9	2985
	α Pegasi	E.	118 26 35	3375	117 3 50	3347	115 40 33	3319	114 16 44	3293
13	Sun	W.	102 54 50	3089	104 23 13	3072	105 51 57	3053	107 21 4	3035
	Spica	W.	41 30 47	2779	43 5 52	2753	44 41 21	2735	46 17 15	2715
	α Aquilæ	E.	61 16 48	3850	60 2 37	3869	58 48 46	3893	57 35 19	3920
	Fomalhaut	E.	88 34 13	2905	87 2 1	2889	85 29 28	2873	83 56 34	2857
	α Pegasi	E.	107 10 3	3168	105 43 15	3143	104 15 58	3121	102 48 14	3098
14	Sun	W.	114 52 22	2941	116 23 49	2922	117 55 40	2902	119 27 56	2883

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh	P.L. of Diff.
14	Spica	W.	47° 53′ 35″	2695	49° 30′ 21″	2677	51° 7′ 32″	2657	52° 45′ 9″	2638
	α Aquilæ	E.	56 22 20	3951	55 9 52	3985	53 57 58	4023	52 46 44	4071
	Fomalhaut	E.	82 23 20	2841	80 49 45	2825	79 15 49	2808	77 41 32	2793
	α Pegasi	E.	101 20 2	3076	99 51 23	3054	98 22 17	3033	96 52 45	3012
15	Sun	W.	121 0 36	2863	122 33 42	2845	124 7 12	2825	125 41 8	2806
	Spica	W.	60 59 50	2541	62 40 6	2521	64 20 50	2502	66 2 1	2482
	Antares	W.	15 19 38	2657	16 57 15	2614	18 35 51	2577	20 15 18	2543
	Fomalhaut	E.	69 45 5	2718	68 8 49	2704	66 32 14	2690	64 55 21	2678
	α Pegasi	E.	89 18 46	2915	87 46 46	2897	86 14 23	2880	84 41 38	2862
16	Spica	W.	74 34 41	2387	76 18 34	2368	78 2 54	2350	79 47 40	2332
	Antares	W.	28 42 56	2411	30 26 15	2389	32 10 6	2367	33 54 28	2346
	Fomalhaut	E.	56 46 58	2626	55 8 38	2618	53 30 8	2613	51 51 31	2609
	α Pegasi	E.	76 52 48	2791	75 18 8	2780	73 43 14	2769	72 8 6	2760
	α Arietis	E.	119 13 9	2495	117 31 49	2472	115 49 57	2451	114 7 35	2429
17	Spica	W.	88 38 1	2246	90 25 20	2230	92 13 3	2214	94 1 10	2199
	Antares	W.	42 43 41	2250	44 30 54	2233	46 18 33	2215	48 6 38	2199
	Fomalhaut	E.	43 38 1	2624	41 59 39	2636	40 21 33	2654	38 43 51	2676
	α Pegasi	E.	64 10 1	2737	62 34 10	2737	60 58 19	2740	59 22 32	2746
	α Arietis	E.	105 28 25	2332	103 43 12	2315	101 57 34	2298	100 11 31	2281
18	Spica	W.	103 7 9	2131	104 57 21	2119	106 47 51	2108	108 38 38	2097
	Antares	W.	57 12 52	2126	59 3 11	2113	60 53 50	2101	62 44 47	2090
	α Pegasi	E.	51 26 46	2821	49 52 45	2848	48 19 20	2881	46 46 37	2920
	α Arietis	E.	91 15 30	2209	89 27 16	2196	87 38 43	2185	85 49 53	2175
	Aldebaran	E.	121 49 31	2145	119 59 40	2132	118 9 29	2118	116 18 58	2107
19	Spica	W.	117 56 18	2055	119 48 27	2049	121 40 45	2043	123 33 12	2039
	Antares	W.	72 3 38	2043	73 56 5	2035	75 48 44	2029	77 41 33	2024
	α Arietis	E.	76 42 11	2135	74 52 5	2130	73 1 52	2126	71 11 32	2122
	Aldebaran	E.	107 2 11	2058	105 10 7	2050	103 17 51	2044	101 25 26	2038
20	Antares	W.	87 7 25	2007	89 0 49	2005	90 54 15	2005	92 47 41	2005
	α Aquilæ	W.	48 20 38	3668	49 37 59	3574	50 57 2	3489	52 17 38	3415
	α Arietis	E.	61 59 13	2124	60 8 50	2128	58 18 33	2133	56 28 24	2139
	Aldebaran	E.	92 1 26	2021	90 8 24	2020	88 15 21	2019	86 22 17	2020
21	Antares	W.	102 14 18	2019	104 7 22	2024	106 0 19	2030	107 58 6	2036
	α Aquilæ	W.	59 19 16	3144	60 46 32	3109	62 14 31	3077	63 43 9	3048
	Fomalhaut	W.	24 24 37	3226	25 50 15	3071	27 19 0	2947	28 50 19	2847
	α Arietis	E.	47 20 52	2196	45 32 19	2214	43 44 12	2233	41 56 34	2256
	Aldebaran	E.	76 57 36	2035	75 4 56	2040	73 12 24	2046	71 20 2	2053
	Pollux	E.	121 3 5	2016	119 9 55	2020	117 16 52	2025	115 23 57	2032
22	Antares	W.	117 14 15	2078	119 5 48	2088	120 57 6	2099	122 48 7	2111
	α Aquilæ	W.	71 13 28	2962	72 44 28	2954	74 15 39	2949	75 46 56	2945
	Fomalhaut	W.	36 52 21	2566	38 32 3	2536	40 12 26	2512	41 53 22	2493
	Aldebaran	E.	62 1 8	2098	60 10 5	2108	58 19 18	2120	56 28 49	2132
	Pollux	E.	106 2 2	2071	104 10 18	2080	102 18 48	2090	100 27 34	2101
	Sun	E.	142 50 55	2400	141 7 20	2408	139 23 56	2416	187 40 44	2425

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
14	Spica	W.	54° 23′ 12″	2618	56° 1′ 42″	2599	57° 40′ 38″	2580	59° 20′ 1″	2561
	α Aquilæ	E.	51 36 14	4122	50 26 34	4180	49 17 49	4246	48 10 6	4320
	Fomalhaut	E.	76 6 55	2778	74 31 58	2762	72 56 40	2747	71 21 2	2732
	α Pegasi	E.	95 22 47	2992	93 52 24	2972	92 21 36	2952	90 50 23	2933
15	Sun	W.	127 15 28	2787	128 50 13	2768	130 25 23	2749	132 0 58	2731
	Spica	W.	67 43 39	2463	69 25 44	2444	71 8 16	2425	72 51 15	2406
	Antares	W.	21 55 31	2513	23 36 26	2485	25 18 0	2459	27 0 11	2435
	Fomalhaut	E.	63 18 11	2666	61 40 45	2654	60 3 3	2643	58 25 7	2634
	α Pegasi	E.	83 8 31	2847	81 35 4	2831	80 1 17	2817	78 27 11	2804
16	Spica	W.	81 32 53	2314	83 18 32	2297	85 4 36	2279	86 51 6	2262
	Antares	W.	35 39 21	2325	37 24 44	2306	39 10 35	2287	40 56 54	2268
	Fomalhaut	E.	50 12 48	2607	48 34 2	2607	46 55 17	2610	45 16 35	2615
	α Pegasi	E.	70 32 46	2752	68 57 15	2746	67 21 36	2741	65 45 51	2738
	α Arietis	E.	112 24 42	2409	110 41 20	2389	108 57 30	2369	107 13 11	2350
17	Spica	W.	95 49 39	2184	97 38 30	2170	99 27 43	2157	101 17 16	2143
	Antares	W.	49 55 7	2183	51 44 0	2169	53 33 15	2153	55 22 53	2139
	Fomalhaut	E.	37 6 39	2705	35 30 6	2741	33 54 21	2786	32 19 35	2842
	α Pegasi	E.	57 46 53	2754	56 11 25	2765	54 36 11	2779	53 1 16	2798
	α Arietis	E.	98 25 3	2265	96 38 12	2250	94 50 59	2236	93 3 25	2222
18	Spica	W.	110 29 42	2087	112 21 1	2078	114 12 34	2070	116 4 20	2062
	Antares	W.	64 36 2	2079	66 27 34	2069	68 19 21	2059	70 11 23	2051
	α Pegasi	E.	45 14 44	2966	43 43 49	3021	42 14 2	3084	40 45 33	3158
	α Arietis	E.	84 0 48	2165	82 11 28	2156	80 21 51	2148	78 32 8	2141
	Aldebaran	E.	114 28 9	2096	112 37 3	2085	110 45 40	2075	108 54 2	2066
19	Spica	W.	125 25 45	2036	127 18 24	2033	129 11 7	2031	131 3 53	2031
	Antares	W.	79 34 30	2019	81 27 35	2014	83 20 47	2011	85 14 4	2009
	α Arietis	E.	69 21 7	2120	67 30 39	2119	65 40 9	2120	63 49 40	2121
	Aldebaran	E.	99 32 51	2033	97 40 8	2029	95 47 19	2026	93 54 25	2023
20	Antares	W.	94 41 7	2007	96 34 31	2009	98 27 51	2012	100 21 7	2015
	α Aquilæ	W.	53 39 38	3347	55 2 55	3287	56 27 22	3234	57 52 51	3187
	α Arietis	E.	54 38 24	2147	52 48 37	2157	50 59 4	2168	49 9 48	2181
	Aldebaran	E.	84 29 14	2091	82 36 13	2094	80 43 16	2096	78 50 23	2099
21	Antares	W.	109 45 44	2043	111 38 11	2052	113 30 25	2059	115 22 27	2068
	α Aquilæ	W.	65 12 22	3025	66 42 4	3004	68 12 12	2987	69 42 41	2973
	Fomalhaut	W.	30 23 46	2766	31 58 58	2701	33 35 37	2646	35 13 29	2602
	α Arietis	E.	40 9 29	2281	38 23 2	2310	36 37 17	2343	34 52 20	2380
	Aldebaran	E.	69 27 50	2061	67 35 50	2068	65 44 2	2077	63 52 27	2087
	Pollux	E.	113 31 12	2038	111 38 37	2045	109 46 13	2053	107 54 1	2061
22	Antares	W.	124 38 50	2122	126 29 15	2134	128 19 22	2147	130 9 9	2162
	α Aquilæ	W.	77 18 18	2944	78 49 41	2945	80 21 3	2948	81 52 21	2954
	Fomalhaut	W.	43 34 45	2478	45 16 29	2467	46 58 29	2459	48 40 40	2453
	Aldebaran	E.	54 38 39	2145	52 48 49	2159	50 59 19	2173	49 10 11	2188
	Pollux	E.	98 36 36	2113	96 45 56	2124	94 55 33	2136	93 5 29	2149
	Sun	E.	135 57 45	2436	134 15 1	2446	132 32 31	2457	130 50 17	2468

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
23	α Aquilæ	W.	83° 23′ 32″	2961	84° 54′ 34″	2969	86° 25′ 26″	2980	87° 56′ 4″	2992
	Fomalhaut	W.	50 22 59	2450	52 5 22	2449	53 47 47	2450	55 30 10	2453
	α Pegasi	W.	36 16 40	3497	37 37 8	3404	38 59 20	3394	40 23 4	3355
	Aldebaran	E.	47 21 25	2904	45 33 3	2920	43 45 5	2937	41 57 33	2956
	Pollux	E.	91 15 44	2162	89 26 19	2174	87 37 13	2188	85 48 28	2202
	Venus	E.	122 8 1	2555	120 28 4	2569	118 48 26	2583	117 9 8	2598
	Sun	E.	129 8 19	2481	127 26 39	2494	125 45 18	2508	124 4 16	2523
24	α Aquilæ	W.	95 24 47	3076	96 53 26	3098	98 21 38	3121	99 49 22	3145
	Fomalhaut	W.	64 0 34	2485	65 42 9	2494	67 23 30	2504	69 4 37	2515
	α Pegasi	W.	47 38 25	3039	49 7 49	3014	50 37 44	2993	52 8 5	2977
	Aldebaran	E.	33 6 56	2359	31 22 23	2384	29 38 25	2411	27 55 6	2440
	Pollux	E.	76 50 5	2277	75 3 31	2291	73 17 19	2307	71 31 30	2323
	Sun	E.	115 44 8	2598	114 5 10	2613	112 26 33	2629	110 48 18	2646
25	α Aquilæ	W.	107 0 8	3291	108 24 30	3325	109 48 13	3361	111 11 14	3399
	Fomalhaut	W.	77 26 11	2577	79 5 37	2591	80 44 44	2605	82 23 32	2619
	α Pegasi	W.	59 43 50	2935	61 15 24	2934	62 47 0	2934	64 18 36	2936
	Pollux	E.	62 48 10	2403	61 4 39	2418	59 21 30	2435	57 38 45	2450
	Sun	E.	102 42 37	2729	101 6 36	2746	99 30 57	2763	97 55 40	2780
26	Fomalhaut	W.	90 32 35	2695	92 9 22	2710	93 45 49	2726	95 21 54	2741
	α Pegasi	W.	71 55 40	2959	73 26 44	2967	74 57 38	2975	76 28 22	2984
	α Arietis	W.	28 18 3	2962	29 49 3	2935	31 20 38	2913	32 52 40	2897
	Pollux	E.	49 10 35	2530	47 30 3	2545	45 49 53	2561	44 10 4	2577
	Sun	E.	90 4 46	2862	88 31 39	2880	86 58 54	2896	85 26 30	2912
27	Fomalhaut	W.	103 17 8	2822	104 51 7	2838	106 24 45	2855	107 58 1	2873
	α Pegasi	W.	83 59 1	3037	85 28 28	3048	86 57 41	3060	88 26 39	3073
	α Arietis	W.	40 36 32	2864	42 9 37	2864	43 42 42	2866	45 15 45	2867
	Pollux	E.	35 56 17	2652	34 18 33	2668	32 41 10	2683	31 4 7	2698
	Sun	E.	77 49 29	2989	76 19 3	3005	74 48 56	3019	73 19 7	3034
28	Fomalhaut	W.	115 38 53	2959	117 9 57	2977	118 40 38	2996	120 10 56	3014
	α Pegasi	W.	95 47 27	3142	97 14 46	3156	98 41 48	3171	100 8 32	3187
	α Arietis	W.	52 59 57	2890	54 32 29	2896	56 4 53	2902	57 37 9	2909
	Aldebaran	W.	22 7 18	2909	23 39 26	2901	25 11 43	2896	26 44 5	2894
	Sun	E.	65 54 28	3104	64 26 23	3118	62 58 35	3130	61 31 2	3143
29	α Pegasi	W.	107 17 26	3270	108 42 13	3288	110 6 39	3306	111 30 44	3325
	α Arietis	W.	65 16 19	2943	66 47 43	2951	68 18 57	2958	69 50 2	2965
	Aldebaran	W.	34 26 5	2904	35 58 19	2908	37 30 28	2913	39 2 30	2918
	Sun	E.	54 17 4	3204	52 51 0	3216	51 25 10	3227	49 59 33	3239
30	α Arietis	W.	77 23 16	3001	78 53 28	3008	80 23 31	3014	81 53 26	3021
	Aldebaran	W.	46 40 59	2946	48 12 19	2952	49 43 32	2958	51 14 37	2964
	Sun	E.	42 54 46	3294	41 30 27	3304	40 6 20	3315	38 42 26	3326
31	α Arietis	W.	89 20 58	3054	90 50 4	3060	92 19 3	3066	93 47 54	3073
	Aldebaran	W.	58 48 16	2992	60 18 39	2997	61 48 55	3002	63 19 5	3008
	Pollux	W.	14 39 24	3098	16 9 2	3096	17 38 43	3093	19 8 27	3092
	Sun	E.	31 46 4	3369	30 23 27	3383	29 1 3	3406	27 38 53	3430

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
23	α Aquilæ	W.	89° 26′ 27″	3005	90° 56′ 33″	3022	92° 26′ 19″	3039	93° 55′ 44″	3056
	Fomalhaut	W.	57 12 30	2457	58 54 44	2462	60 36 50	2469	62 18 47	2476
	α Pegasi	W.	41 48 8	3197	43 14 21	3147	44 41 34	3105	46 9 38	3069
	Aldebaran	E.	40 10 28	2274	38 23 50	2294	36 37 41	2315	34 52 3	2336
	Pollux	E.	84 0 4	2917	82 12 2	2931	80 24 21	2946	78 37 2	2961
	Venus	E.	115 30 10	2613	113 51 33	2629	112 13 17	2645	110 35 23	2661
	Sun	E.	122 23 34	2536	120 43 11	2551	119 3 9	2566	117 23 28	2582
24	α Aquilæ	W.	101 16 37	3171	102 43 21	3198	104 9 32	3228	105 35 8	3259
	Fomalhaut	W.	70 45 29	2527	72 26 5	2538	74 6 25	2551	75 46 27	2564
	α Pegasi	W.	53 38 47	2963	55 9 46	2953	56 40 58	2945	58 12 20	2939
	Aldebaran	E.	26 12 28	2472	24 30 35	2506	22 49 33	2548	21 9 26	2594
	Pollux	E.	69 46 4	2339	68 1 1	2355	66 16 21	2371	64 32 4	2387
	Sun	E.	109 10 25	2662	107 32 54	2679	105 55 46	2695	104 19 0	2713
25	α Aquilæ	W.	112 33 32	3438	113 55 5	3480	115 15 51	3525	116 35 48	3571
	Fomalhaut	W.	84 2 1	2634	85 40 10	2649	87 17 59	2664	88 55 27	2679
	α Pegasi	W.	65 50 11	2938	67 21 42	2942	68 53 8	2946	70 24 28	2953
	Pollux	E.	55 56 22	2467	54 14 22	2482	52 32 44	2499	50 51 29	2514
	Sun	E.	96 20 46	2797	94 46 14	2813	93 12 3	2830	91 38 14	2846
26	Fomalhaut	W.	96 57 39	2757	98 33 3	2773	100 8 6	2789	101 42 48	2806
	α Pegasi	W.	77 58 55	2993	79 29 16	3004	80 59 24	3014	82 29 19	3025
	α Arietis	W.	34 25 3	2684	35 57 42	2676	37 30 32	2669	39 3 30	2666
	Pollux	E.	42 30 37	2591	40 51 30	2607	39 12 45	2623	37 34 21	2638
	Sun	E.	83 54 26	2927	82 22 42	2943	80 51 18	2959	79 20 14	2974
27	Fomalhaut	W.	109 30 55	2890	111 3 27	2906	112 35 38	2924	114 7 27	2943
	α Pegasi	W.	89 55 21	3087	91 23 47	3100	92 51 57	3114	94 19 50	3127
	α Arietis	W.	46 48 46	2671	48 21 42	2675	49 54 33	2680	51 27 18	2684
	Pollux	E.	29 27 24	2713	27 51 1	2728	26 14 58	2744	24 39 16	2759
	Sun	E.	71 49 36	3048	70 20 23	3062	68 51 27	3077	67 22 49	3091
28	Fomalhaut	W.	121 40 51	3034	123 10 21	3054	124 39 27	3075	126 8 7	3096
	α Pegasi	W.	101 34 57	3303	103 1 4	3319	104 26 51	3335	105 52 19	3353
	α Arietis	W.	59 9 16	2916	60 41 15	2923	62 13 5	2930	63 44 46	2936
	Aldebaran	W.	28 16 31	2894	29 48 57	2894	31 21 23	2897	32 53 46	2900
	Sun	E.	60 3 44	3156	58 36 41	3168	57 9 54	3181	55 43 22	3193
29	α Pegasi	W.	112 54 26	3345	114 17 45	3365	115 40 41	3387	117 3 12	3410
	α Arietis	W.	71 20 59	2972	72 51 47	2979	74 22 26	2987	75 52 55	2993
	Aldebaran	W.	40 34 26	2924	42 6 15	2929	43 37 57	2935	45 9 32	2941
	Sun	E.	48 34 10	3249	47 8 59	3261	45 44 2	3273	44 19 18	3286
30	α Arietis	W.	83 23 13	3027	84 52 52	3034	86 22 22	3041	87 51 44	3047
	Aldebaran	W.	52 45 35	2969	54 16 26	2975	55 47 10	2981	57 17 46	2986
	Sun	E.	37 18 45	3337	35 55 16	3347	34 31 59	3358	33 8 55	3370
31	α Arietis	W.	95 16 37	3078	96 45 13	3085	98 13 41	3091	99 42 1	3097
	Aldebaran	W.	64 49 8	3013	66 19 5	3018	67 48 56	3022	69 18 41	3027
	Pollux	W.	20 38 13	3089	22 7 59	3092	23 37 45	3092	25 7 30	3095
	Sun	E.	26 16 59	3434	24 55 21	3450	23 34 1	3467	22 13 1	3484

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	10 41 23.07	9.074	N. 8 18 9.5	-54.45	15 53.59	64.41	0 3.93	0.781
Wed.	2	10 45 0 71	9.062	7 56 18.6	54.78	15 53.82	64.36	0 22.80	0.793
Thur.	3	10 48 38.07	9.051	7 34 20.0	55.10	15 54.05	64.32	0 41.94	0.804
Frid.	4	10 52 15.17	9.040	7 12 13.9	-55.40	15 54.29	64.28	1 1.34	0.815
Sat.	5	10 55 52.02	9.030	6 50 0.8	55.69	15 54.53	64.25	1 20.98	0.825
SUN.	6	10 59 28.63	9.021	6 27 40.9	55.96	15 54.77	64.22	1 40.87	0.834
Mon.	7	11 3 5.02	9.012	6 5 14.7	-56.22	15 55.02	64.19	2 0.99	0.843
Tues.	8	11 6 41.21	9.004	5 42 42.6	56.46	15 55.27	64.16	2 21.29	0.851
Wed.	9	11 10 17.21	8.996	5 20 4.8	56.69	15 55.53	64.14	2 41.79	0.859
Thur.	10	11 13 53.03	8.990	4 57 21.7	-56.90	15 55.78	64.12	3 2.46	0.865
Frid.	11	11 17 28.71	8.984	4 34 33.6	57.10	15 56.04	64.10	3 23.28	0.871
Sat.	12	11 21 4.26	8.979	4 11 40.8	57.28	15 56.30	64.08	3 44.24	0.876
SUN.	13	11 24 39.69	8.975	3 48 43.7	-57.45	15 56.56	64.07	4 5.30	0.880
Mon.	14	11 28 15.03	8.972	3 25 42.7	57.61	15 56.82	64.06	4 26.45	0.883
Tues.	15	11 31 50.30	8.969	3 2 38.1	57.76	15 57.09	64.05	4 47.67	0.886
Wed.	16	11 35 25.52	8.968	2 39 30.1	-57.89	15 57.35	64.05	5 8.95	0.887
Thur.	17	11 39 0.72	8.968	2 16 19.1	58.01	15 57.61	64.05	5 30.24	0.888
Frid.	18	11 42 35.92	8.968	1 53 5.4	58.12	15 57.87	64.05	5 51.54	0.887
Sat.	19	11 46 11.15	8.969	1 29 49.3	-58.21	15 58.14	64.06	6 12.81	0.886
SUN.	20	11 49 46.42	8.972	1 6 31.0	58.29	15 58.40	64.07	6 34.04	0.883
Mon.	21	11 53 21.76	8.975	0 43 11.0	58.36	15 58.67	64.08	6 55.19	0.880
Tues.	22	11 56 57.20	8.979	N. 0 19 49.5	-58.42	15 58.93	64.09	7 16.25	0.876
Wed.	23	12 0 32.76	8.984	S. 0 3 33.2	58.46	15 59.20	64.11	7 37.18	0.871
Thur.	24	12 4 8 46	8.991	0 26 56.7	58.49	15 59.46	64.13	7 57.98	0.864
Frid.	25	12 7 44.31	8.998	0 50 20.7	-58.50	15 59.73	64.15	8 18.61	0.857
Sat.	26	12 11 20.35	9.006	1 13 44.9	58.50	16 0.00	64.17	8 39.07	0.849
SUN.	27	12 14 56.60	9.015	1 37 8.9	58.49	16 0.27	64.20	8 59.32	0.840
Mon.	28	12 18 33.07	9.025	2 0 32.5	-58.46	16 0.54	64.23	9 19.35	0.830
Tues.	29	12 22 9.78	9.035	2 23 55.2	58.41	16 0.81	64.27	9 39.13	0.820
Wed.	30	12 25 46.75	9.046	2 47 16.7	58.35	16 1.08	64.31	9 58.66	0.809
Thur.	31	12 29 24.00	9.058	S. 3 10 36.6	-58.28	16 1.35	64.35	10 17.91	0.797

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign - prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	10 41 23.08	9.076	N. 8 18 9.4	−54.46	0 3.93	0.781	10 41 27.01
Wed.	2	10 45 0.76	9.064	7 56 18.2	54.79	0 22.80	0.793	10 45 23.56
Thur.	3	10 48 38.17	9.053	7 34 19.3	55.11	0 41.94	0.804	10 49 20.11
Frid.	4	10 52 15.32	9.042	7 12 12.9	−55.41	1 1.35	0.815	10 53 16.67
Sat.	5	10 55 52.22	9.032	6 49 59.5	55.70	1 21.00	0.825	10 57 13.22
SUN.	6	10 59 28.88	9.023	6 27 39.3	55.97	1 40.89	0.834	11 1 9.77
Mon.	7	11 3 5.32	9.014	6 5 12.8	−56.23	2 1.00	0.843	11 5 6.32
Tues.	8	11 6 41.56	9.006	5 42 40.3	56.47	2 21.32	0.851	11 9 2.88
Wed.	9	11 10 17.61	8.998	5 20 2.2	56.70	2 41.83	0.859	11 12 59.44
Thur.	10	11 13 53.48	8.992	4 57 18.8	−56.91	3 2.51	0.865	11 16 55.99
Frid.	11	11 17 29.21	8.986	4 34 30.4	57.11	3 23.33	0.871	11 20 52.54
Sat.	12	11 21 4.81	8.981	4 11 37.3	57.30	3 44.29	0.876	11 24 49.10
SUN.	13	11 24 40.29	8.977	3 48 39.9	−57.47	4 5.36	0.880	11 28 45.65
Mon.	14	11 28 15.69	8.974	3 25 38.5	57.63	4 26.51	0.883	11 32 42.20
Tues.	15	11 31 51.01	8.971	3 2 33.5	57.78	4 47.74	0.886	11 36 38.75
Wed.	16	11 35 26.29	8.970	2 39 25.2	−57.91	5 9.02	0.887	11 40 35.31
Thur.	17	11 39 1.54	8.970	2 16 13.8	58.03	5 30.32	0.888	11 44 31.86
Frid.	18	11 42 36.79	8.970	1 52 59.7	58.14	5 51.62	0.887	11 48 28.41
Sat.	19	11 46 12.07	8.971	1 29 43.3	−58.23	6 12.90	0.886	11 52 24.97
SUN.	20	11 49 47.39	8.974	1 6 24.7	58.31	6 34.13	0.883	11 56 21.52
Mon.	21	11 53 22.79	8.977	0 43 4.3	58.38	6 55.29	0.880	12 0 18.08
Tues.	22	11 56 58.28	8.981	N. 0 19 42.5	−58.44	7 16.35	0.876	12 4 14.63
Wed.	23	12 0 33.89	8.986	S. 0 3 40.6	58.48	7 37.29	0.871	12 8 11.18
Thur.	24	12 4 9.65	8.993	0 27 4.5	58.51	7 58.09	0.864	12 12 7.74
Frid.	25	12 7 45.56	9.000	0 50 28.8	−58.52	8 18.73	0.857	12 16 4.29
Sat.	26	12 11 21.65	9.008	1 13 53.3	58.52	8 39.19	0.849	12 20 0.84
SUN.	27	12 14 57.95	9.017	1 37 17.7	58.51	8 59.44	0.840	12 23 57.39
Mon.	28	12 18 34.47	9.027	2 0 41.6	−58.48	9 19.47	0.830	12 27 53.94
Tues.	29	12 22 11.24	9.037	2 24 4.6	58.43	9 39.26	0.820	12 31 50.50
Wed.	30	12 25 48.26	9.048	2 47 26.4	58.37	9 58.79	0.809	12 35 47.05
Thur.	31	12 29 25.56	9.060	S. 3 10 46.6	−58.30	10 18.04	0.797	12 39 43.60

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	244	158 44 2.7	43 43.1	145.31	+ 0.54	0.0038131	−43.3	13 16 22.17
2	245	159 42 11.1	41 51.4	145.39	0.56	0.0037086	43.9	13 12 26.26
3	246	160 40 21.3	40 1.5	145.46	0.55	0.0036024	44.6	13 8 30.36
4	247	161 38 33.2	38 13.3	145.53	+ 0.51	0.0034945	−45.2	13 4 34.45
5	248	162 36 46.7	36 26.7	145.60	0.44	0.0033850	45.9	13 0 38.54
6	249	163 35 1.9	34 41.8	145.67	0.34	0.0032740	46.5	12 56 42.63
7	250	164 33 18.7	32 58.5	145.73	+ 0.22	0.0031614	−47.2	12 52 46.72
8	251	165 31 37.1	31 16.8	145.80	+ 0.08	0.0030475	47.8	12 48 50.82
9	252	166 29 57.1	29 36.7	145.86	− 0.05	0.0029322	48.3	12 44 54.91
10	253	167 28 18.6	27 58.1	145.93	− 0.18	0.0028158	−48.7	12 40 59.00
11	254	168 26 41.6	26 21.0	145.99	0.30	0.0026985	49.0	12 37 3.10
12	255	169 25 6.2	24 45.4	146.06	0.41	0.0025805	49.3	12 33 7.20
13	256	170 23 32.4	23 11.5	146.13	− 0.51	0.0024618	−49.5	12 29 11.29
14	257	171 22 0.3	21 39.3	146.20	0.58	0.0023427	49.7	12 25 15.38
15	258	172 20 29.9	20 8.8	146.27	0.62	0.0022233	49.8	12 21 19.47
16	259	173 19 1.3	18 40.1	146.34	− 0.63	0.0021036	−49.8	12 17 23.56
17	260	174 17 34.4	17 13.1	146.42	0.61	0.0019839	49.9	12 13 27.65
18	261	175 16 9.3	15 47.9	146.49	0.56	0.0018642	49.9	12 9 31.74
19	262	176 14 46.1	14 24.6	146.57	− 0.48	0.0017444	−49.9	12 5 35.84
20	263	177 13 25.0	13 3.4	146.66	0.38	0.0016246	49.9	12 1 39.93
21	264	178 12 6.1	11 44.4	146.75	0.26	0.0015048	49.9	11 57 44.02
22	265	179 10 49.3	10 27.5	146.84	− 0.13	0.0013850	−49.9	11 53 48.11
23	266	180 9 34.7	9 12.8	146.94	0.00	0.0012652	49.9	11 49 52.21
24	267	181 8 22.3	8 0.3	147.03	+ 0.14	0.0011452	50.0	11 45 56.31
25	268	182 7 12.1	6 50.0	147.12	+ 0.25	0.0010249	−50.2	11 42 0.40
26	269	183 6 4.2	5 42.0	147.21	0.35	0.0009043	50.4	11 38 4.49
27	270	184 4 58.7	4 36.4	147.31	0.43	0.0007832	50.6	11 34 8.58
28	271	185 3 55.5	3 33.1	147.40	+ 0.49	0.0006616	−50.8	11 30 12.68
29	272	186 2 54.5	2 32.0	147.50	0.51	0.0005394	51.1	11 26 16.77
30	273	187 1 55.7	1 33.1	147.59	0.50	0.0004164	51.4	11 22 20.86
31	274	188 0 59.1	0 36.4	147.68	+ 0.46	0.0002928	−51.7	11 18 24.96

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 51.5	14 49.3	54 25.0	−0.73	54 16.9	−0.62	23 31.1	1.82	27.8
2	14 47.4	14 45.9	54 10.1	0.52	54 4.6	0.41	6		28.8
3	14 44.8	14 44.0	54 0.4	0.30	53 57.5	−0.19	0 13.6	1.73	0.2
4	14 43.6	14 43.5	53 55.9	−0.08	53 55.7	+0.05	0 54.3	1.67	1.2
5	14 43.9	14 44.6	53 57.0	+0.18	53 59.8	0.31	1 34.0	1.65	2.2
6	14 45.8	14 47.6	54 4.3	0.46	54 10.6	0.60	2 13.6	1.66	3.2
7	14 49.7	14 52.5	54 18.6	+0.76	54 28.6	+0.92	2 54.0	1.72	4.2
8	14 55.7	14 59.5	54 40 6	1.09	54 54.6	1.26	3 36.4	1.82	5.2
9	15 3.9	15 8.9	55 10.7	1.44	55 29.0	1.62	4 21.6	1.96	6.2
10	15 14.5	15 20.5	55 49.4	+1.79	56 11.7	+1.94	5 10.4	2.12	7.2
11	15 27.1	15 34.1	56 35.9	2.09	57 1.7	2.21	6 3.3	2.28	8.2
12	15 41.5	15 49.2	57 28.9	2.31	57 57.1	2.38	7 0.0	2.42	9.2
13	15 57.1	16 4.9	58 25.9	+2.40	58 54.6	+2.38	7 59.3	2.49	10.2
14	16 12.6	16 19.9	59 22.8	2.30	59 49.8	2.17	8 59.4	2.48	11.2
15	16 26.7	16 32.8	60 14.8	1.98	60 37.2	1.73	9 58.5	2.42	12.2
16	16 38.0	16 42.0	60 56.1	+1.41	61 10.9	+1.06	10 55.5	2.33	13.2
17	16 44.8	16 46.3	61 21.3	+0.66	61 26.6	+0.24	11 50.2	2.25	14.2
18	16 46.3	16 45.0	61 26.9	−0.20	61 22.0	−0.62	12 43.3	2.19	15.2
19	16 42.3	16 38.4	61 12.1	−1.02	60 57.7	−1.38	13 35.6	2.19	16.2
20	16 33.4	16 27.4	60 39.2	1.69	60 17.3	1.95	14 28.3	2.22	17.2
21	16 20.7	16 13.4	59 52.6	2.14	59 26.0	2.28	15 22.0	2.26	18.2
22	16 5.8	15 58.0	58 58.0	−2.36	58 29.4	−2.39	16 17.0	2.31	19.2
23	15 50.2	15 42.6	58 0.8	2.36	57 32.8	2.30	17 12.9	2.33	20.2
24	15 35.2	15 28.2	57 5.7	2.21	56 39.9	2.09	18 8.8	2.30	21.2
25	15 21.6	15 15.5	56 15.7	−1.94	55 53.4	−1.79	19 3.2	2.22	22.2
26	15 10.0	15 5.0	55 33.0	1.62	55 14.6	1.46	19 55.2	2.10	23.2
27	15 0.5	14 56.6	54 58.2	1.28	54 43.9	1.11	20 44.1	1.97	24.2
28	14 53.3	14 50.5	54 31.7	−0.94	54 21.4	−0.79	21 29.8	1.85	25.2
29	14 48.2	14 46.4	54 12.9	0.63	54 6.3	0.49	22 12.8	1.75	26.2
30	14 45.0	14 44.1	54 1.3	0.35	53 57.9	−0.22	22 53.8	1.68	27.2
31	14 43.6	14 43.5	53 56.1	−0.10	53 55.7	+0.03	23 33.7	1.65	28.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 29 49.44	2.0343	N.19 58 5.0	9.015
1	9 31 51.36	2.0297	19 49 1.6	9.099
2	9 33 53.00	2.0250	19 39 53.2	9.182
3	9 35 54.36	2.0203	19 30 39.8	9.264
4	9 37 55.44	2.0157	19 21 21.5	9.344
5	9 39 56.25	2.0112	19 11 58.5	9.423
6	9 41 56.78	2.0066	19 2 30.8	9.501
7	9 43 57.04	2.0020	18 52 58.4	9.579
8	9 45 57.02	1.9974	18 43 21.3	9.657
9	9 47 56.73	1.9929	18 33 39.6	9.733
10	9 49 56.17	1.9885	18 23 53.4	9.808
11	9 51 55.35	1.9841	18 14 2.7	9.882
12	9 53 54.26	1.9796	18 4 7.6	9.955
13	9 55 52.90	1.9752	17 54 8.1	10.027
14	9 57 51.28	1.9708	17 44 4.3	10.098
15	9 59 49.40	1.9665	17 33 56.3	10.168
16	10 1 47.26	1.9622	17 23 44.1	10.238
17	10 3 44.86	1.9579	17 13 27.7	10.307
18	10 5 42.21	1.9537	17 3 7.3	10.374
19	10 7 39.30	1.9494	16 52 42.8	10.441
20	10 9 36.14	1.9452	16 42 14.3	10.506
21	10 11 32.73	1.9411	16 31 42.0	10.571
22	10 13 29.07	1.9369	16 21 5.8	10.636
23	10 15 25.16	1.9328	N.16 10 25.7	10.699

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 17 21.01	1.9288	N.15 59 41.9	10.761
1	10 19 16.62	1.9248	15 48 54.4	10.822
2	10 21 11.99	1.9208	15 38 3.2	10.883
3	10 23 7.12	1.9169	15 27 8.4	10.943
4	10 25 2.02	1.9131	15 16 10.1	11.002
5	10 26 56.69	1.9092	15 5 8.2	11.060
6	10 28 51.12	1.9054	14 54 2.9	11.117
7	10 30 45.33	1.9016	14 42 54.2	11.172
8	10 32 39.31	1.8978	14 31 42.2	11.227
9	10 34 33.07	1.8942	14 20 26.9	11.282
10	10 36 26.61	1.8906	14 9 8.3	11.336
11	10 38 19.94	1.8870	13 57 46.6	11.388
12	10 40 13.05	1.8834	13 46 21.8	11.439
13	10 42 5.95	1.8799	13 34 53.9	11.490
14	10 43 58.64	1.8764	13 23 23.0	11.540
15	10 45 51.12	1.8730	13 11 49.1	11.590
16	10 47 43.40	1.8697	13 0 12.2	11.639
17	10 49 35.48	1.8663	12 48 32.4	11.686
18	10 51 27.35	1.8629	12 36 49.8	11.732
19	10 53 19.03	1.8597	12 25 4.5	11.778
20	10 55 10.52	1.8566	12 13 16.4	11.824
21	10 57 1.82	1.8535	12 1 25.6	11.868
22	10 58 52.94	1.8504	11 49 32.2	11.911
23	11 0 43.87	1.8473	11 37 36.3	11.954
24	11 2 34.62	1.8443	N.11 25 37.8	11.996

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 2 34.62	1.8443	N.11 25 37.8	11.996
1	11 4 25.19	1.8414	11 13 36.8	12.037
2	11 6 15.59	1.8385	11 1 33.4	12.077
3	11 8 5.81	1.8357	10 49 27.6	12.116
4	11 9 55.87	1.8329	10 37 19.5	12.154
5	11 11 45.76	1.8302	10 25 9.1	12.192
6	11 13 35.49	1.8275	10 12 56.4	12.230
7	11 15 25.06	1.8248	10 0 41.5	12.266
8	11 17 14.47	1.8222	9 48 24.5	12.301
9	11 19 3.73	1.8197	9 36 5.4	12.336
10	11 20 52.84	1.8173	9 23 44.2	12.370
11	11 22 41.81	1.8149	9 11 21.0	12.402
12	11 24 30.63	1.8125	8 58 55.9	12.434
13	11 26 19.31	1.8102	8 46 28.9	12.466
14	11 28 7.86	1.8080	8 34 0.0	12.497
15	11 29 56.27	1.8058	8 21 29.2	12.527
16	11 31 44.55	1.8036	8 8 56.7	12.556
17	11 33 32.70	1.8015	7 56 22.5	12.584
18	11 35 20.73	1.7995	7 43 46.6	12.611
19	11 37 8.64	1.7975	7 31 9.1	12.638
20	11 38 56.43	1.7956	7 18 30.0	12.665
21	11 40 44.11	1.7937	7 5 49.3	12.691
22	11 42 31.68	1.7919	6 53 7.1	12.715
23	11 44 19.14	1.7902	N. 6 40 23.5	12.739

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 46 6.50	1.7885	N. 6 27 38.4	12.762
1	11 47 53.76	1.7868	6 14 52.0	12.784
2	11 49 40.92	1.7852	6 2 4.3	12.806
3	11 51 27.99	1.7837	5 49 15.3	12.827
4	11 53 14.97	1.7823	5 36 25.0	12.847
5	11 55 1.87	1.7809	5 23 33.6	12.866
6	11 56 48.68	1.7796	5 10 41.1	12.884
7	11 58 35.41	1.7782	4 57 47.5	12.902
8	12 0 22.07	1.7770	4 44 52.8	12.920
9	12 2 8.65	1.7758	4 31 57.1	12.937
10	12 3 55.17	1.7747	4 19 0.4	12.952
11	12 5 41.62	1.7737	4 6 2.8	12.967
12	12 7 28.01	1.7727	3 53 4.3	12.982
13	12 9 14.34	1.7717	3 40 5.0	12.995
14	12 11 0.62	1.7709	3 27 4.9	13.008
15	12 12 46.85	1.7701	3 14 4.0	13.021
16	12 14 33.03	1.7693	3 1 2.4	13.032
17	12 16 19.17	1.7686	2 48 0.2	13.043
18	12 18 5.26	1.7679	2 34 57.3	13.053
19	12 19 51.32	1.7674	2 21 53.8	13.062
20	12 21 37.35	1.7669	2 8 49.8	13.070
21	12 23 23.35	1.7664	1 55 45.4	13.078
22	12 25 9.32	1.7660	1 42 40.5	13.086
23	12 26 55.27	1.7657	1 29 35.1	13.093
24	12 28 41.21	1.7655	N. 1 16 29.3	13.099

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION..

SATURDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 28 41.21	1.7655	N. 1 16 29.3	13.099
1	12 30 27.13	1.7653	1 3 23.2	13.103
2	12 32 13.04	1.7652	0 50 16.9	13.107
3	12 33 58.95	1.7651	0 37 10.3	13.111
4	12 35 44.85	1.7650	0 24 3.5	13.114
5	12 37 30.75	1.7651	N. 0 10 56.6	13.117
6	12 39 16.66	1.7652	S. 0 2 10.5	13.118
7	12 41 2.57	1.7653	0 15 17.6	13.119
8	12 42 48.50	1.7656	0 28 24.8	13.120
9	12 44 34.44	1.7659	0 41 32.0	13.119
10	12 46 20.40	1.7662	0 54 39.1	13.118
11	12 48 6.38	1.7666	1 7 46.1	13.116
12	12 49 52.39	1.7671	1 20 53.0	13.113
13	12 51 38.43	1.7677	1 33 59.7	13.110
14	12 53 24.51	1.7682	1 47 6.2	13.106
15	12 55 10.62	1.7688	2 0 12.4	13.101
16	12 56 56.77	1.7696	2 13 18.3	13.096
17	12 58 42.97	1.7704	2 26 23.9	13.090
18	13 0 29.22	1.7712	2 39 29.1	13.083
19	13 2 15.52	1.7722	2 52 33.9	13.076
20	13 4 1.88	1.7732	3 5 38.2	13.067
21	13 5 48.30	1.7743	3 18 41.9	13.057
22	13 7 34.79	1.7754	3 31 45.0	13.048
23	13 9 21.35	1.7765	S. 3 44 47.6	13.038

SUNDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 11 7.97	1.7777	S. 3 57 49.6	13.027
1	13 12 54.67	1.7790	4 10 50.9	13.015
2	13 14 41.45	1.7804	4 23 51.4	13.003
3	13 16 28.32	1.7819	4 36 51.2	12.990
4	13 18 15.28	1.7833	4 49 50.2	12.976
5	13 20 2.32	1.7848	5 2 48.3	12.961
6	13 21 49.45	1.7863	5 15 45.5	12.946
7	13 23 36.68	1.7881	5 28 41.8	12.930
8	13 25 24.02	1.7899	5 41 37.1	12.913
9	13 27 11.47	1.7917	5 54 31.3	12.895
10	13 28 59.03	1.7936	6 7 24.5	12.877
11	13 30 46.70	1.7955	6 20 16.6	12.858
12	13 32 34.49	1.7975	6 33 7.5	12.838
13	13 34 22.40	1.7996	6 45 57.2	12.818
14	13 36 10.44	1.8017	6 58 45.6	12.797
15	13 37 58.60	1.8039	7 11 32.8	12.776
16	13 39 46.90	1.8062	7 24 18.7	12.752
17	13 41 35.34	1.8085	7 37 3.1	12.728
18	13 43 23.92	1.8109	7 49 46.1	12.704
19	13 45 12.65	1.8133	8 2 27.6	12.679
20	13 47 1.52	1.8158	8 15 7.6	12.654
21	13 48 50.54	1.8184	8 27 46.1	12.628
22	13 50 39.72	1.8211	8 40 23.0	12.601
23	13 52 29.07	1.8238	8 52 58.2	12.573
24	13 54 18.58	1.8266	S. 9 5 31.7	12.544

MONDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 54 18.58	1.8266	S. 9 5 31.7	12.544
1	13 56 8.26	1.8294	9 18 3.5	12.515
2	13 57 58.11	1.8322	9 30 33.5	12.484
3	13 59 48.13	1.8352	9 43 1.6	12.453
4	14 1 38.34	1.8383	9 55 27.8	12.421
5	14 3 28.73	1.8414	10 7 52.1	12.388
6	14 5 19.31	1.8446	10 20 14.4	12.355
7	14 7 10.08	1.8478	10 32 34.7	12.321
8	14 9 1.05	1.8511	10 44 52.9	12.286
9	14 10 52.21	1.8544	10 57 9.0	12.251
10	14 12 43.58	1.8578	11 9 23.0	12.214
11	14 14 35.15	1.8612	11 21 34.7	12.176
12	14 16 26.93	1.8648	11 33 44.1	12.137
13	14 18 18.93	1.8685	11 45 51.2	12.098
14	14 20 11.15	1.8721	11 57 55.9	12.059
15	14 22 3.58	1.8758	12 9 58.3	12.019
16	14 23 56.24	1.8797	12 21 58.2	11.977
17	14 25 49.14	1.8836	12 33 55.5	11.934
18	14 27 42.27	1.8874	12 45 50.2	11.890
19	14 29 35.63	1.8914	12 57 42.3	11.847
20	14 31 29.24	1.8955	13 9 31.8	11.802
21	14 33 23.09	1.8996	13 21 18.5	11.755
22	14 35 17.19	1.9037	13 33 2.4	11.708
23	14 37 11.54	1.9079	S. 13 44 43.5	11.661

TUESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 39 6.14	1.9122	S. 13 56 21.8	11.613
1	14 41 1.00	1.9165	14 7 57.1	11.563
2	14 42 56.12	1.9209	14 19 29.4	11.513
3	14 44 51.51	1.9254	14 30 58.7	11.462
4	14 46 47.17	1.9299	14 42 24.9	11.410
5	14 48 43.10	1.9345	14 53 47.9	11.356
6	14 50 39.31	1.9392	15 5 7.6	11.302
7	14 52 35.80	1.9439	15 16 24.1	11.247
8	14 54 32.57	1.9486	15 27 37.3	11.192
9	14 56 29.63	1.9534	15 38 47.1	11.135
10	14 58 26.98	1.9582	15 49 53.5	11.077
11	15 0 24.62	1.9631	16 0 56.4	11.018
12	15 2 22.55	1.9680	16 11 55.7	10.958
13	15 4 20.78	1.9731	16 22 51.4	10.898
14	15 6 19.32	1.9782	16 33 43.5	10.836
15	15 8 18.17	1.9834	16 44 31.8	10.773
16	15 10 17.33	1.9886	16 55 16.3	10.710
17	15 12 16.80	1.9938	17 5 57.0	10.647
18	15 14 16.59	1.9991	17 16 33.9	10.582
19	15 16 16.70	2.0045	17 27 6.8	10.514
20	15 18 17.13	2.0098	17 37 35.6	10.446
21	15 20 17.88	2.0152	17 48 0.3	10.377
22	15 22 18.96	2.0207	17 58 20.9	10.308
23	15 24 20.37	2.0263	18 8 37.3	10.237
24	15 26 22.12	2.0319	S. 18 18 49.4	10.166

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 26 22.12	2.0319	S. 18 18 49.4	10.166
1	15 28 24.20	2.0375	18 28 57.2	10.093
2	15 30 26.62	2.0432	18 39 0.6	10.019
3	15 32 29.39	2.0490	18 48 59.5	9.944
4	15 34 32.50	2.0548	18 58 53.8	9.868
5	15 36 35.96	2.0606	19 8 43.6	9.792
6	15 38 39.77	2.0664	19 18 28.8	9.714
7	15 40 43.93	2.0723	19 28 9.3	9.634
8	15 42 48.45	2.0782	19 37 44.9	9.553
9	15 44 53.32	2.0842	19 47 15.6	9.471
10	15 46 58.55	2.0902	19 56 41.4	9.389
11	15 49 4.14	2.0962	20 6 2.3	9.306
12	15 51 10.10	2.1023	20 15 18.1	9.221
13	15 53 16.42	2.1084	20 24 28.8	9.135
14	15 55 23.11	2.1146	20 33 34.3	9.048
15	15 57 30.17	2.1207	20 42 34.6	8.960
16	15 59 37.60	2.1269	20 51 29.5	8.870
17	16 1 45.40	2.1332	21 0 19.0	8.780
18	16 3 53.58	2.1395	21 9 3.1	8.688
19	16 6 2.14	2.1457	21 17 41.6	8.595
20	16 8 11.07	2.1520	21 26 14.5	8.502
21	16 10 20.38	2.1583	21 34 41.8	8.407
22	16 12 30.07	2.1647	21 43 3.3	8.310
23	16 14 40.14	2.1711	S. 21 51 19.0	8.212

THURSDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 16 50.60	2.1775	S. 21 59 28.8	8.113
1	16 19 1.44	2.1838	22 7 32.6	8.013
2	16 21 12.66	2.1902	22 15 30.4	7.912
3	16 23 24.27	2.1967	22 23 22.1	7.810
4	16 25 36.26	2.2031	22 31 7.6	7.707
5	16 27 48.64	2.2096	22 38 46.9	7.603
6	16 30 1.41	2.2161	22 46 19.9	7.497
7	16 32 14.57	2.2225	22 53 46.5	7.389
8	16 34 28.11	2.2289	23 1 6.6	7.281
9	16 36 42.04	2.2354	23 8 20.2	7.172
10	16 38 56.36	2.2419	23 15 27.2	7.061
11	16 41 11.07	2.2483	23 22 27.5	6.948
12	16 43 26.16	2.2547	23 29 21.0	6.835
13	16 45 41.64	2.2612	23 36 7.7	6.721
14	16 47 57.51	2.2677	23 42 47.5	6.605
15	16 50 13.76	2.2741	23 49 20.3	6.488
16	16 52 30.40	2.2806	23 55 46.0	6.370
17	16 54 47.43	2.2870	24 2 4.7	6.252
18	16 57 4.84	2.2933	24 8 16.2	6.131
19	16 59 22.63	2.2997	24 14 20.4	6.008
20	17 1 40.81	2.3061	24 20 17.2	5.885
21	17 3 59.37	2.3124	24 26 6.6	5.761
22	17 6 18.30	2.3187	24 31 48.5	5.636
23	17 8 37.61	2.3250	24 37 22.9	5.509
24	17 10 57.30	2.3312	S. 24 42 49.6	5.381

FRIDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 10 57.30	2.3312	S. 24 42 49.6	5.381
1	17 13 17.36	2.3374	24 48 8.6	5.252
2	17 15 37.79	2.3437	24 53 19.8	5.122
3	17 17 58.60	2.3499	24 58 23.2	4.991
4	17 20 19.78	2.3559	25 3 18.7	4.858
5	17 22 41.31	2.3618	25 8 6.2	4.724
6	17 25 3.20	2.3678	25 12 45.6	4.588
7	17 27 25.45	2.3738	25 17 16.8	4.452
8	17 29 48.06	2.3798	25 21 39.9	4.316
9	17 32 11.03	2.3857	25 25 54.7	4.177
10	17 34 34.35	2.3915	25 30 1.1	4.037
11	17 36 58.01	2.3972	25 33 59.1	3.897
12	17 39 22.02	2.4030	25 37 48.7	3.755
13	17 41 46.37	2.4086	25 41 29.7	3.612
14	17 44 11.05	2.4142	25 45 2.1	3.467
15	17 46 36.07	2.4197	25 48 25.8	3.322
16	17 49 1.41	2.4251	25 51 40.7	3.175
17	17 51 27.08	2.4305	25 54 46.8	3.028
18	17 53 53.07	2.4358	25 57 44.1	2.880
19	17 56 19.38	2.4410	26 0 32.4	2.730
20	17 58 45.99	2.4461	26 3 11.7	2.579
21	18 1 12.91	2.4512	26 5 41.9	2.427
22	18 3 40.13	2.4562	26 8 3.0	2.275
23	18 6 7.65	2.4612	S. 26 10 14.9	2.122

SATURDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 8 35.47	2.4660	S. 26 12 17.6	1.967
1	18 11 3.57	2.4707	26 14 10.9	1.811
2	18 13 31.95	2.4753	26 15 54.9	1.655
3	18 16 0.61	2.4799	26 17 29.5	1.497
4	18 18 29.54	2.4844	26 18 54.6	1.339
5	18 20 58.74	2.4887	26 20 10.2	1.180
6	18 23 28.19	2.4930	26 21 16.2	1.019
7	18 25 57.90	2.4972	26 22 12.5	0.858
8	18 28 27.86	2.5013	26 22 59.2	0.697
9	18 30 58.06	2.5052	26 23 36.2	0.535
10	18 33 28.49	2.5090	26 24 3.4	0.372
11	18 35 59.14	2.5127	26 24 20.8	0.207
12	18 38 30.01	2.5163	26 24 28.3	− 0.042
13	18 41 1.10	2.5199	26 24 25.9	+ 0.123
14	18 43 32.40	2.5234	26 24 13.5	0.289
15	18 46 3.91	2.5267	26 23 51.2	0.456
16	18 48 35.61	2.5299	26 23 18.8	0.624
17	18 51 7.50	2.5331	26 22 36.3	0.792
18	18 53 39.58	2.5361	26 21 43.7	0.961
19	18 56 11.83	2.5389	26 20 41.0	1.130
20	18 58 44.25	2.5416	26 19 28.1	1.300
21	19 1 16.82	2.5442	26 18 5.0	1.470
22	19 3 49.55	2.5467	26 16 31.7	1.641
23	19 6 22.43	2.5491	26 14 48.1	1.812
24	19 8 55.44	2.5513	S. 26 12 54.3	1.982

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					**TUESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 8 55.44	2.5513	S.26 12 54.3	1.982	0	21 11 43.60	2.5241	S.21 19 33.8	10.090
1	19 11 28.58	2.5534	26 10 50.2	2.155	1	21 14 14.96	2.5212	21 9 23.8	10.242
2	19 14 1.85	2.5555	26 8 35.7	2.328	2	21 16 46.14	2.5183	20 59 4.7	10.394
3	19 16 35.25	2.5575	26 6 10.8	2.501	3	21 19 17.14	2.5152	20 48 36.5	10.545
4	19 19 8.75	2.5592	26 3 35.5	2.674	4	21 21 47.96	2.5121	20 37 59.3	10.694
5	19 21 42.35	2.5607	26 0 49.9	2.847	5	21 24 18.59	2.5090	20 27 13.2	10.843
6	19 24 16.04	2.5622	25 57 53.9	3.020	6	21 26 49.04	2.5058	20 16 18.3	10.992
7	19 26 49.82	2.5637	25 54 47.5	3.194	7	21 29 19.29	2.5026	20 5 14.6	11.134
8	19 29 23.68	2.5650	25 51 30.6	3.368	8	21 31 49.35	2.4994	19 54 2.2	11.277
9	19 31 57.62	2.5662	25 48 3.3	3.542	9	21 34 19.22	2.4962	19 42 41.3	11.419
10	19 34 31.63	2.5672	25 44 25.5	3.717	10	21 36 48.89	2.4928	19 31 11.9	11.561
11	19 37 5.69	2.5681	25 40 37.3	3.891	11	21 39 18.35	2.4893	19 19 34.0	11.701
12	19 39 39.80	2.5688	25 36 38.6	4.065	12	21 41 47.61	2.4859	19 7 47.8	11.839
13	19 42 13.95	2.5695	25 32 29.5	4.239	13	21 44 16.66	2.4825	18 55 53.3	11.976
14	19 44 48.14	2.5701	25 28 9.9	4.414	14	21 46 45.51	2.4791	18 43 50.7	12.111
15	19 47 22.36	2.5705	25 23 39.8	4.588	15	21 49 14.15	2.4756	18 31 40.0	12.245
16	19 49 56.60	2.5708	25 18 59.3	4.763	16	21 51 42.58	2.4720	18 19 21.3	12.377
17	19 52 30.86	2.5710	25 14 8.3	4.937	17	21 54 10.79	2.4684	18 6 54.7	12.507
18	19 55 5.12	2.5710	25 9 6.9	5.110	18	21 56 38.79	2.4648	17 54 20.4	12.636
19	19 57 39.38	2.5710	25 3 55.1	5.283	19	21 59 6.57	2.4613	17 41 38.4	12.764
20	20 0 13.64	2.5708	24 58 32.9	5.457	20	22 1 34.14	2.4577	17 28 48.7	12.891
21	20 2 47.88	2.5705	24 53 0.2	5.631	21	22 4 1.49	2.4540	17 15 51.5	13.015
22	20 5 22.10	2.5701	24 47 17.1	5.804	22	22 6 28.62	2.4503	17 2 46.9	13.137
23	20 7 56.29	2.5696	S.24 41 23.7	5.976	23	22 8 55.53	2.4467	S.16 49 35.0	13.259
	MONDAY 14.					**WEDNESDAY 16.**			
0	20 10 30.45	2.5690	S.24 35 20.0	6.149	0	22 11 22.23	2.4431	S.16 36 15.8	13.379
1	20 13 4.57	2.5682	24 29 5.9	6.321	1	22 13 48.71	2.4394	16 22 49.5	13.496
2	20 15 38.63	2.5673	24 22 41.5	6.492	2	22 16 14.96	2.4357	16 9 16.3	13.611
3	20 18 12.64	2.5663	24 16 6.9	6.662	3	22 18 40.99	2.4320	15 55 36.2	13.725
4	20 20 46.59	2.5652	24 9 22.0	6.833	4	22 21 6.80	2.4284	15 41 49.3	13.837
5	20 23 20.47	2.5641	24 2 26.9	7.003	5	22 23 32.40	2.4247	15 27 55.7	13.947
6	20 25 54.28	2.5628	23 55 21.6	7.173	6	22 25 57.77	2.4210	15 13 55.6	14.056
7	20 28 28.01	2.5614	23 48 6.1	7.342	7	22 28 22.92	2.4174	14 59 49.0	14.163
8	20 31 1.65	2.5598	23 40 40.5	7.510	8	22 30 47.86	2.4138	14 45 36.0	14.268
9	20 33 35.19	2.5582	23 33 4.9	7.677	9	22 33 12.58	2.4102	14 31 16.8	14.372
10	20 36 8.64	2.5566	23 25 19.3	7.844	10	22 35 37.09	2.4066	14 16 51.4	14.473
11	20 38 41.99	2.5548	23 17 23.6	8.011	11	22 38 1.38	2.4030	14 2 20.0	14.572
12	20 41 15.22	2.5529	23 9 18.0	8.176	12	22 40 25.45	2.3994	13 47 42.7	14.670
13	20 43 48.34	2.5510	23 . 1 2.5	8.341	13	22 42 49.31	2.3959	13 32 59.6	14.766
14	20 46 21.34	2.5489	22 52 37.1	8.504	14	22 45 12.96	2.3923	13 18 10.8	14.859
15	20 48 54.21	2.5467	22 44 2.0	8.667	15	22 47 36.39	2.3888	13 3 16.5	14.951
16	20 51 26.95	2.5445	22 35 17.1	8.829	16	22 49 59.61	2.3853	12 48 16.7	15.041
17	20 53 59.55	2.5422	22 26 22.5	8.990	17	22 52 22.63	2.3819	12 33 11.6	15.129
18	20 56 32.02	2.5399	22 17 18.3	9.150	18	22 54 45.44	2.3785	12 18 1.2	15.216
19	20 59 4.34	2.5374	22 8 4.5	9.310	19	22 57 8.05	2.3751	12 2 45.7	15.299
20	21 1 36.51	2.5348	21 58 41.1	9.468	20	22 59 30.45	2.3717	11 47 25.3	15.381
21	21 4 8.52	2.5322	21 49 8.3	9.625	21	23 1 52.65	2.3684	11 32 0.0	15.461
22	21 6 40.38	2.5296	21 39 26.1	9.781	22	23 4 14.65	2.3651	11 16 30.0	15.538
23	21 9 12.07	2.5269	21 29 34.6	9.936	23	23 6 36.46	2.3618	11 0 55.4	15.615
24	21 11 43.60	2.5241	S.21 19 33.8	10.090	24	23 8 58.07	2.3586	S.10 45 16.2	15.690

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 8 58.07	2.3586	S. 10 45 16.2	15.690
1	23 11 19.49	2.3554	10 29 32.6	15.762
2	23 13 40.72	2.3522	10 13 44.8	15.831
3	23 16 1.76	2.3492	9 57 52.9	15.899
4	23 18 22.62	2.3462	9 41 56.9	15.966
5	23 20 43.30	2.3432	9 25 57.0	16.030
6	23 23 3.80	2.3402	9 9 53.3	16.092
7	23 25 24.12	2.3373	8 53 46.0	16.152
8	23 27 44.27	2.3344	8 37 35.1	16.210
9	23 30 4.25	2.3316	8 21 20.8	16.265
10	23 32 24.06	2.3288	8 5 3.3	16.318
11	23 34 43.70	2.3260	7 48 42.6	16.371
12	23 37 3.18	2.3233	7 32 18.8	16.421
13	23 39 22.50	2.3207	7 15 52.1	16.468
14	23 41 41.67	2.3182	6 59 22.7	16.513
15	23 44 0.69	2.3157	6 42 50.6	16.556
16	23 46 19.56	2.3133	6 26 16.0	16.597
17	23 48 38.29	2.3110	6 9 38.9	16.637
18	23 50 56.88	2.3087	5 52 59.5	16.674
19	23 53 15.33	2.3064	5 36 18.0	16.708
20	23 55 33.65	2.3042	5 19 34.5	16.742
21	23 57 51.83	2.3020	5 2 49.0	16.773
22	0 0 9.89	2.2999	4 46 1.7	16.802
23	0 2 27.82	2.2978	S. 4 29 12.8	16.828

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 4 45.63	2.2958	S. 4 12 22.3	16.853
1	0 7 3.32	2.2940	3 55 30.4	16.876
2	0 9 20.91	2.2922	3 38 37.2	16.897
3	0 11 38.39	2.2904	3 21 42.8	16.915
4	0 13 55.76	2.2887	3 4 47.4	16.931
5	0 16 13.03	2.2871	2 47 51.1	16.946
6	0 18 30.21	2.2855	2 30 53.9	16.958
7	0 20 47.29	2.2839	2 13 56.1	16.968
8	0 23 4.28	2.2825	1 56 57.7	16.977
9	0 25 21.19	2.2811	1 39 58.9	16.983
10	0 27 38.02	2.2798	1 22 59.7	16.987
11	0 29 54.77	2.2785	1 6 0.4	16.989
12	0 32 11.44	2.2773	0 49 1.0	16.989
13	0 34 28.04	2.2762	0 32 1.7	16.987
14	0 36 44.58	2.2752	S. 0 15 2.6	16.983
15	0 39 1.06	2.2742	N. 0 1 56.3	16.977
16	0 41 17.48	2.2733	0 18 54.7	16.969
17	0 43 33.85	2.2724	0 35 52.6	16.959
18	0 45 50.17	2.2716	0 52 49.8	16.947
19	0 48 6.44	2.2708	1 9 46.3	16.933
20	0 50 22.67	2.2702	1 26 41.8	16.917
21	0 52 38.87	2.2696	1 43 36.3	16.899
22	0 54 55.03	2.2691	2 0 29.7	16.879
23	0 57 11.16	2.2687	2 17 21.8	16.857
24	0 59 27.27	2.2683	N. 2 31 12.6	16.834

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 59 27.27	2.2683	N. 2 34 12.6	16.834
1	1 1 43.35	2.2679	2 51 1.9	16.808
2	1 3 59.42	2.2676	3 7 49.6	16.780
3	1 6 15.47	2.2674	3 24 35.5	16.750
4	1 8 31.51	2.2673	3 41 19.6	16.719
5	1 10 47.55	2.2672	3 58 1.8	16.687
6	1 13 3.58	2.2672	4 14 42.0	16.652
7	1 15 19.61	2.2673	4 31 20.0	16.614
8	1 17 35.65	2.2674	4 47 55.7	16.574
9	1 19 51.70	2.2676	5 4 28.9	16.533
10	1 22 7.76	2.2678	5 20 59.6	16.491
11	1 24 23.84	2.2681	5 37 27.8	16.446
12	1 26 39.94	2.2685	5 53 53.2	16.399
13	1 28 56.06	2.2689	6 10 15.7	16.351
14	1 31 12.21	2.2694	6 26 35.3	16.302
15	1 33 28.39	2.2699	6 42 51.9	16.250
16	1 35 44.60	2.2705	6 59 5.3	16.196
17	1 38 0.85	2.2711	7 15 15.4	16.141
18	1 40 17.14	2.2718	7 31 22.2	16.084
19	1 42 33.47	2.2726	7 47 25.5	16.025
20	1 44 49.85	2.2735	8 3 25.2	15.963
21	1 47 6.29	2.2744	8 19 21.1	15.900
22	1 49 22.78	2.2753	8 35 13.2	15.837
23	1 51 39.33	2.2763	N. 8 51 1.5	15.772

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 53 55.94	2.2773	N. 9 6 45.8	15.704
1	1 56 12.61	2.2784	9 22 26.0	15.635
2	1 58 29.35	2.2796	9 38 2.0	15.563
3	2 0 46.16	2.2808	9 53 33.6	15.490
4	2 3 3.04	2.2820	10 9 0.8	15.417
5	2 5 20.00	2.2832	10 24 23.6	15.341
6	2 7 37.03	2.2845	10 39 41.8	15.263
7	2 9 54.14	2.2859	10 54 55.2	15.184
8	2 12 11.34	2.2874	11 10 3.9	15.104
9	2 14 28.63	2.2889	11 25 7.7	15.022
10	2 16 46.01	2.2904	11 40 6.5	14.938
11	2 19 3.48	2.2919	11 55 0.2	14.853
12	2 21 21.04	2.2935	12 9 48.8	14.766
13	2 23 38.70	2.2952	12 24 32.1	14.677
14	2 25 56.46	2.2968	12 39 10.1	14.587
15	2 28 14.31	2.2984	12 53 42.6	14.496
16	2 30 32.27	2.3002	13 8 9.6	14.403
17	2 32 50.34	2.3020	13 22 31.0	14.309
18	2 35 8.51	2.3038	13 36 46.7	14.213
19	2 37 26.79	2.3056	13 50 56.6	14.117
20	2 39 45.18	2.3075	14 5 0.7	14.018
21	2 42 3.69	2.3094	14 18 58.8	13.918
22	2 44 22.31	2.3113	14 32 50.9	13.817
23	2 46 41.04	2.3132	14 46 36.8	13.714
24	2 48 59.89	2.3152	N. 15 0 16.5	13.610

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 48 59.89	2.3152	N.15 0 16.5	13.610
1	2 51 18.86	2.3172	15 13 50.0	13.505
2	2 53 37.95	2.3192	15 27 17.1	13.397
3	2 55 57.16	2.3212	15 40 37.7	13.289
4	2 58 16.49	2.3232	15 53 51.8	13.181
5	3 0 35.94	2.3252	16 6 59.4	13.071
6	3 2 55.52	2.3273	16 20 0.3	12.958
7	3 5 15.22	2.3294	16 32 54.4	12.845
8	3 7 35.05	2.3315	16 45 41.7	12.731
9	3 9 55.00	2.3336	16 58 22.1	12.615
10	3 12 15.08	2.3357	17 10 55.5	12.498
11	3 14 35.28	2.3378	17 23 21.9	12.381
12	3 16 55.61	2.3399	17 35 41.2	12.262
13	3 19 16.07	2.3421	17 47 53.3	12.142
14	3 21 36.66	2.3442	17 59 58.2	12.020
15	3 23 57.37	2.3463	18 11 55.7	11.897
16	3 26 18.21	2.3484	18 23 45.8	11.774
17	3 28 39.18	2.3506	18 35 28.5	11.650
18	3 31 0.28	2.3527	18 47 3.8	11.525
19	3 33 21.50	2.3548	18 58 31.5	11.397
20	3 35 42.85	2.3569	19 9 51.5	11.269
21	3 38 4.33	2.3590	19 21 3.8	11.140
22	3 40 25.93	2.3610	19 32 8.3	11.011
23	3 42 47.65	2.3630	N.19 43 5.1	10.881

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 45 9.49	2.3650	N.19 53 54.0	10.749
1	3 47 31.45	2.3671	20 4 35.0	10.617
2	3 49 53.54	2.3692	20 15 8.0	10.483
3	3 52 15.75	2.3712	20 25 32.9	10.348
4	3 54 38.08	2.3731	20 35 49.7	10.213
5	3 57 0.52	2.3750	20 45 58.5	10.078
6	3 59 23.08	2.3769	20 55 59.1	9.941
7	4 1 45.75	2.3788	21 5 51.4	9.803
8	4 4 8.53	2.3807	21 15 35.4	9.665
9	4 6 31.43	2.3825	21 25 11.2	9.527
10	4 8 54.43	2.3843	21 34 38.6	9.388
11	4 11 17.54	2.3861	21 43 57.5	9.244
12	4 13 40.76	2.3878	21 53 7.9	9.103
13	4 16 4.08	2.3894	22 2 9.8	8.961
14	4 18 27.49	2.3910	22 11 3.2	8.818
15	4 20 51.00	2.3926	22 19 48.0	8.675
16	4 23 14.60	2.3941	22 28 24.2	8.531
17	4 25 38.29	2.3957	22 36 51.7	8.386
18	4 28 2.08	2.3972	22 45 10.5	8.240
19	4 30 25.95	2.3985	22 53 20.5	8.094
20	4 32 49.90	2.3998	23 1 21.8	7.948
21	4 35 13.93	2.4011	23 9 14.3	7.801
22	4 37 38.03	2.4024	23 16 57.9	7.654
23	4 40 2.21	2.4036	23 24 32.7	7.506
24	4 42 26.46	2.4047	N.23 31 58.6	7.357

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 42 26.46	2.4047	N.23 31 58.6	7.367
1	4 44 50.77	2.4058	23 39 15.5	7.207
2	4 47 15.15	2.4068	23 46 23.5	7.058
3	4 49 39.59	2.4077	23 53 22.5	6.908
4	4 52 4.08	2.4086	24 0 12.5	6.758
5	4 54 28.62	2.4094	24 6 53.5	6.607
6	4 56 53.21	2.4102	24 13 25.4	6.456
7	4 59 17.84	2.4109	24 19 48.2	6.305
8	5 1 42.51	2.4115	24 26 2.0	6.154
9	5 4 7.22	2.4121	24 32 6.7	6.002
10	5 6 31.96	2.4126	24 38 2.2	5.849
11	5 8 56.73	2.4130	24 43 48.6	5.697
12	5 11 21.52	2.4133	24 49 25.9	5.545
13	5 13 46.33	2.4136	24 54 54.0	5.392
14	5 16 11.15	2.4138	25 0 12.9	5.239
15	5 18 35.98	2.4139	25 5 22.7	5.086
16	5 21 0.82	2.4139	25 10 23.3	4.932
17	5 23 25.65	2.4138	25 15 14.6	4.778
18	5 25 50.48	2.4137	25 19 56.7	4.625
19	5 28 15.30	2.4136	25 24 29.6	4.472
20	5 30 40.11	2.4133	25 28 53.3	4.318
21	5 33 4.90	2.4130	25 33 7.8	4.164
22	5 35 29.67	2.4125	25 37 13.0	4.010
23	5 37 54.40	2.4119	N.25 41 9.0	3.857

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 40 19.10	2.4114	N.25 44 55.8	3.703
1	5 42 43.77	2.4107	25 48 33.4	3.550
2	5 45 8.39	2.4099	25 52 1.8	3.396
3	5 47 32.96	2.4090	25 55 20.9	3.242
4	5 49 57.47	2.4081	25 58 30.8	3.089
5	5 52 21.93	2.4072	26 1 31.6	2.936
6	5 54 46.33	2.4061	26 4 23.1	2.782
7	5 57 10.66	2.4049	26 7 5.4	2.629
8	5 59 34.91	2.4036	26 9 38.6	2.477
9	6 1 59.09	2.4023	26 12 2.6	2.324
10	6 4 23.19	2.4008	26 14 17.5	2.172
11	6 6 47.19	2.3993	26 16 23.2	2.019
12	6 9 11.10	2.3977	26 18 19.8	1.867
13	6 11 34.91	2.3960	26 20 7.3	1.716
14	6 13 58.62	2.3942	26 21 45.7	1.565
15	6 16 22.21	2.3923	26 23 15.1	1.414
16	6 18 45.69	2.3904	26 24 35.4	1.263
17	6 21 9.06	2.3884	26 25 46.7	1.112
18	6 23 32.30	2.3863	26 26 48.9	0.962
19	6 25 55.41	2.3841	26 27 42.2	0.813
20	6 28 18.39	2.3818	26 28 26.5	0.663
21	6 30 41.23	2.3795	26 29 1.8	0.514
22	6 33 3.93	2.3770	26 29 28.2	0.366
23	6 35 26.47	2.3744	26 29 45.8	0.219
24	6 37 48.86	2.3718	N.26 29 54.5	+ 0.072

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 37 48.86	2.3718	N.26 29 54.5	+ 0.072
1	6 40 11.09	2.3692	26 29 54.4	− 0.075
2	6 42 33.16	2.3664	26 29 45.5	0.222
3	6 44 55.06	2.3636	26 29 27.8	0.368
4	6 47 16.79	2.3607	26 29 1.3	0.513
5	6 49 38.34	2.3577	26 28 26.2	0.657
6	6 51 59.72	2.3547	26 27 42.4	0.802
7	6 54 20.91	2.3516	26 26 49.9	0.946
8	6 56 41.91	2.3483	26 25 48.9	1.089
9	6 59 2.71	2.3450	26 24 39.3	1.232
10	7 1 23.31	2.3417	26 23 21.1	1.373
11	7 3 43.71	2.3383	26 21 54.5	1.514
12	7 6 3.91	2.3348	26 20 19.4	1.655
13	7 8 23.89	2.3313	26 18 35.9	1.795
14	7 10 43.66	2.3277	26 16 44.0	1.934
15	7 13 3.21	2.3240	26 14 43.8	2.072
16	7 15 22.54	2.3202	26 12 35.3	2.210
17	7 17 41.64	2.3164	26 10 18.6	2.348
18	7 20 0.51	2.3125	26 7 53.6	2.485
19	7 22 19.14	2.3086	26 5 20.4	2.620
20	7 24 37.54	2.3047	26 2 39.2	2.754
21	7 26 55.70	2.3006	25 59 49.9	2.888
22	7 29 13.61	2.2964	25 56 52.6	3.022
23	7 31 31.27	2.2923	N.25 53 47.3	3.155

SATURDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 33 48.69	2.2882	N.25 50 34.0	3.287
1	7 36 5.85	2.2839	25 47 12.8	3.418
2	7 38 22.75	2.2796	25 43 43.8	3.548
3	7 40 39.40	2.2752	25 40 7.0	3.678
4	7 42 55.78	2.2707	25 36 22.5	3.807
5	7 45 11.89	2.2663	25 32 30.2	3.935
6	7 47 27.74	2.2619	25 28 30.3	4.062
7	7 49 43.32	2.2573	25 24 22.8	4.188
8	7 51 58.62	2.2527	25 20 7.8	4.313
9	7 54 13.65	2.2482	25 15 45.3	4.438
10	7 56 28.41	2.2436	25 11 15.3	4.562
11	7 58 42.88	2.2389	25 6 37.9	4.684
12	8 0 57.07	2.2341	25 1 53.2	4.806
13	8 3 10.97	2.2294	24 57 1.2	4.927
14	8 5 24.59	2.2247	24 52 1.9	5.047
15	8 7 37.93	2.2199	24 46 55.5	5.166
16	8 9 50.98	2.2150	24 41 42.0	5.284
17	8 12 3.73	2.2101	24 36 21.4	5.402
18	8 14 16.19	2.2052	24 30 53.7	5.520
19	8 16 28.36	2.2003	24 25 19.0	5.635
20	8 18 40.23	2.1954	24 19 37.5	5.749
21	8 20 51.81	2.1905	24 13 49.1	5.863
22	8 23 3.09	2.1855	24 7 53.9	5.977
23	8 25 14.07	2.1805	24 1 51.9	6.089
24	8 27 24.75	2.1755	N.23 55 43.2	6.200

SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 27 24.75	2.1755	N.23 55 43.2	6.200
1	8 29 35.13	2.1705	23 49 27.9	0.310
2	8 31 45.21	2.1655	23 43 6.0	6.420
3	8 33 54.99	2.1604	23 36 37.5	6.528
4	8 36 4.46	2.1553	23 30 2.6	6.635
5	8 38 13.63	2.1503	23 23 21.3	6.742
6	8 40 22.50	2.1452	23 16 33.6	6.847
7	8 42 31.06	2.1402	23 9 39.6	6.952
8	8 44 39.32	2.1352	23 2 39.3	7.056
9	8 46 47.28	2.1301	22 55 32.9	7.158
10	8 48 54.93	2.1250	22 48 20.4	7.260
11	8 51 2.28	2.1199	22 41 1.7	7.362
12	8 53 9.32	2.1148	22 33 37.0	7.462
13	8 55 16.06	2.1097	22 26 6.3	7.561
14	8 57 22.49	2.1047	22 18 29.7	7.658
15	8 59 28.62	2.0997	22 10 47.3	7.755
16	9 1 34.45	2.0946	22 2 59.1	7.852
17	9 3 39.97	2.0896	21 55 5.1	7.947
18	9 5 45.20	2.0846	21 47 5.4	8.042
19	9 7 50.13	2.0796	21 39 0.1	8.135
20	9 9 54.75	2.0745	21 30 49.2	8.227
21	9 11 59.07	2.0695	21 22 32.8	8.319
22	9 14 3.09	2.0645	21 14 10.9	8.410
23	9 16 6.81	2.0596	N.21 5 43.6	8.499

MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 18 10.24	2.0547	N.20 57 11.0	8.588
1	9 20 13.37	2.0497	20 48 33.1	8.676
2	9 22 16.20	2.0448	20 39 49.9	8.763
3	9 24 18.74	2.0399	20 31 1.5	8.849
4	9 26 20.99	2.0351	20 22 8.0	8.934
5	9 28 22.95	2.0302	20 13 9.4	9.017
6	9 30 24.61	2.0253	20 4 5.9	9.100
7	9 32 25.98	2.0205	19 54 57.4	9.183
8	9 34 27.07	2.0158	19 45 43.9	9.265
9	9 36 27.88	2.0111	19 36 25.6	9.345
10	9 38 28.40	2.0064	19 27 2.5	9.425
11	9 40 28.64	2.0017	19 17 34.6	9.504
12	9 42 28.60	1.9970	19 8 2.0	9.582
13	9 44 28.28	1.9923	18 58 24.7	9.659
14	9 46 27.68	1.9877	18 48 42.9	9.734
15	9 48 26.81	1.9832	18 38 56.6	9.809
16	9 50 25.67	1.9787	18 29 5.8	9.884
17	9 52 24.25	1.9741	18 19 10.5	9.957
18	9 54 22.56	1.9696	18 9 10.9	10.029
19	9 56 20.60	1.9652	17 59 7.0	10.101
20	9 58 18.38	1.9608	17 48 58.8	10.172
21	10 0 15.90	1.9565	17 38 46.3	10.242
22	10 2 13.16	1.9522	17 28 29.7	10.311
23	10 4 10.16	1.9479	17 18 9.0	10.379
24	10 6 6.90	1.9436	N.17 7 44.3	10.446

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 6 6.90	1.9436	N.17 7 44.3	10.446
1	10 8 3.39	1.9394	16 57 15.5	10.512
2	10 9 59.63	1.9352	16 46 42.8	10.577
3	10 11 55.61	1.9310	16 36 6.2	10.642
4	10 13 51.35	1.9270	16 25 25.8	10.706
5	10 15 46.85	1.9230	16 14 41.5	10.769
6	10 17 42.11	1.9190	16 3 53.5	10.831
7	10 19 37.13	1.9150	15 53 1.8	10.893
8	10 21 31.91	1.9111	15 42 6.5	10.953
9	10 23 26.46	1.9072	15 31 7.6	11.012
10	10 25 20.78	1.9034	15 20 5.1	11.070
11	10 27 14.87	1.8996	15 8 59.2	11.128
12	10 29 8.73	1.8958	14 57 49.8	11.185
13	10 31 2.37	1.8921	14 46 37.0	11.241
14	10 32 55.79	1.8885	14 35 20.9	11.296
15	10 34 48.99	1.8849	14 24 1.5	11.351
16	10 36 41.98	1.8814	14 12 38.8	11.404
17	10 38 34.76	1.8779	14 1 13.0	11.457
18	10 40 27.33	1.8745	13 49 44.0	11.509
19	10 42 19.70	1.8711	13 38 11.9	11.560
20	10 44 11.86	1.8677	13 26 36.8	11.611
21	10 46 3.82	1.8643	13 14 58.6	11.661
22	10 47 55.58	1.8611	13 3 17.5	11.709
23	10 49 47.15	1.8579	N.12 51 33.5	11.757

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	10 51 38.53	1.8548	N.12 39 46.6	11.805
1	10 53 29.72	1.8517	12 27 56.9	11.851
2	10 55 20.73	1.8486	12 16 4.5	11.896
3	10 57 11.55	1.8455	12 4 9.4	11.941
4	10 59 2.19	1.8426	11 52 11.6	11.986
5	11 0 52.66	1.8397	11 40 11.1	12.029
6	11 2 42.96	1.8369	11 28 8.1	12.071
7	11 4 33.09	1.8341	11 16 2.6	12.113
8	11 6 23.05	1.8313	11 3 54.6	12.154
9	11 8 12.85	1.8286	10 51 44.1	12.195
10	11 10 2.49	1.8260	10 39 31.2	12.234
11	11 11 51.97	1.8234	10 27 16.0	12.272
12	11 13 41.30	1.8209	10 14 58.6	12.309
13	11 15 30.48	1.8184	10 2 38.9	12.346
14	11 17 19.51	1.8160	9 50 17.0	12.383
15	11 19 8.40	1.8137	9 37 52.9	12.419
16	11 20 57.15	1.8114	9 25 26.7	12.453
17	11 22 45.77	1.8092	9 12 58.5	12.487
18	11 24 34.25	1.8069	9 0 28.2	12.521
19	11 26 22.60	1.8048	8 47 56.0	12.553
20	11 28 10.83	1.8027	8 35 21.9	12.585
21	11 29 58.93	1.8007	8 22 45.8	12.617
22	11 31 46.91	1.7987	8 10 7.9	12.646
23	11 33 34.78	1.7968	7 57 28.3	12.675
24	11 35 22.53	1.7949	N. 7 44 46.9	12.704

THURSDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 35 22.53	1.7949	N. 7 44 46.9	12.704

PHASES OF THE MOON.

		d	h	m
● New Moon	Sept.	2	20	16.0
☽ First Quarter		10	23	7.5
○ Full Moon		17	17	3.8
☾ Last Quarter		24	11	7.2

		d	h
☾ Apogee	Sept.	4	8.2
☾ Perigee		17	18.4

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	α Arietis	W.	101° 10′ 14″	3103	102° 38′ 20″	3110	104° 6′ 18″	3115	105° 34′ 9″	3122
	Aldebaran	W.	70 48 20	3031	72 17 54	3036	73 47 22	3040	75 16 45	3045
	Pollux	W.	26 37 12	3027	28 6 51	3030	29 36 27	3033	31 5 59	3036
	Sun	E.	20 52 21	3509	19 32 7	3534	18 12 20	3564	16 53 6	3599
4	Sun	W.	13 23 16	3745	14 39 16	3693	15 56 11	3654	17 13 47	3625
	Spica	E.	28 49 16	3153	27 22 11	3163	25 55 17	3173	24 28 35	3186
	Antares	E.	74 28 54	3086	73 0 27	3087	71 32 2	3088	70 3 38	3088
5	Sun	W.	23 47 40	3546	25 7 13	3536	26 26 57	3527	27 46 51	3519
	Antares	E.	62 41 44	3089	61 13 21	3089	59 44 58	3088	58 16 34	3087
	α Aquilæ	E.	108 46 26	3981	107 34 28	3965	106 22 14	3951	105 9 46	3937
6	Sun	W.	34 28 23	3485	35 49 4	3480	37 9 51	3473	38 30 45	3468
	Antares	E.	50 54 14	3080	49 25 40	3078	47 57 4	3076	46 28 25	3073
	α Aquilæ	E.	99 4 20	3884	97 50 44	3875	96 36 59	3867	95 23 6	3860
7	Sun	W.	45 16 58	3435	46 38 35	3428	48 0 20	3421	49 22 13	3413
	Antares	E.	39 4 17	3058	37 35 16	3054	36 6 10	3051	34 37 0	3047
	α Aquilæ	E.	89 12 4	3833	87 57 36	3830	86 43 5	3826	85 28 30	3824
8	Sun	W.	56 13 53	3371	57 36 43	3362	58 59 43	3353	60 22 54	3343
	Spica	W.	19 44 9	3124	21 11 50	3100	22 40 0	3077	24 8 38	3056
	α Aquilæ	E.	79 15 12	3821	78 0 32	3823	76 45 54	3826	75 31 19	3829
	Fomalhaut	E.	109 43 23	3178	108 16 47	3167	106 49 58	3155	105 22 55	3143
9	Sun	W.	67 21 50	3287	68 46 17	3275	70 10 58	3262	71 35 54	3249
	Spica	W.	31 37 41	2969	33 8 33	2954	34 39 44	2938	36 11 15	2923
	α Aquilæ	E.	69 19 34	3861	68 5 35	3871	66 51 46	3883	65 38 9	3896
	Fomalhaut	E.	98 4 11	3085	96 35 43	3073	95 7 1	3061	93 38 4	3049
	α Pegasi	E.	116 13 41	3405	114 51 30	3382	113 28 53	3359	112 5 50	3338
10	Sun	W.	78 44 30	3179	80 11 4	3163	81 37 57	3148	83 5 8	3133
	Spica	W.	43 53 39	2846	45 27 7	2831	47 0 55	2815	48 35 3	2799
	α Aquilæ	E.	59 34 4	3993	58 22 18	4022	57 11 0	4052	56 0 12	4087
	Fomalhaut	E.	86 9 29	2986	84 38 59	2973	83 8 13	2960	81 37 10	2947
	Jupiter	E.	96 11 56	2774	94 36 54	2761	93 1 35	2747	91 25 57	2733
	α Pegasi	E.	105 4 28	3235	103 39 0	3216	102 13 10	3197	100 46 57	3178
11	Sun	W.	90 25 56	3049	91 55 8	3031	93 24 42	3014	94 54 38	2995
	Spica	W.	56 31 3	2716	58 7 21	2699	59 44 2	2682	61 21 6	2664
	α Aquilæ	E.	50 15 54	4331	49 9 30	4398	48 4 7	4475	46 59 53	4559
	Fomalhaut	E.	73 57 49	2882	72 25 7	2869	70 52 8	2856	69 18 53	2844
	Jupiter	E.	83 22 56	2657	81 45 18	2640	80 7 18	2624	78 28 56	2607
	α Pegasi	E.	93 30 19	3088	92 1 55	3071	90 33 10	3055	89 4 5	3038
12	Sun	W.	102 30 6	2901	104 2 24	2882	105 35 6	2862	107 8 13	2843
	Spica	W.	69 32 27	2574	71 11 57	2556	72 51 53	2537	74 32 15	2519
	Antares	W.	23 42 7	2609	25 20 50	2585	27 0 6	2561	28 39 54	2538
	Fomalhaut	E.	61 28 41	2786	59 53 55	2775	58 18 55	2766	56 43 43	2757
	Jupiter	E.	70 11 20	2522	68 30 37	2504	66 49 30	2487	65 7 58	2468
	α Pegasi	E.	81 33 39	2962	80 2 38	2947	78 31 19	2934	76 59 43	2921

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
1	α Arietis	W.	107° 1′ 52″	3127	108° 29′ 29″	3133	109° 56′ 58″	3139	111° 24′ 20″	3146
	Aldebaran	W.	76 46 2	3048	78 15 15	3052	79 44 23	3056	81 13 26	3060
	Pollux	W.	32 35 27	3039	34 4 52	3042	35 34 13	3045	37 3 30	3047
	Sun	E.	15 34 31	3644	14 16 44	3702	12 59 59	3779	11 44 35	3884
4	Sun	W.	18 31 54	3604	19 50 24	3586	21 9 14	3571	22 28 20	3558
	Spica	E.	23 2 8	3198	21 35 57	3216	20 10 7	3236	18 44 41	3260
	Antares	E.	68 35 14	3089	67 6 51	3090	65 38 29	3090	64 10 7	3089
5	Sun	W.	29 6 54	3512	30 27 5	3505	31 47 24	3498	33 7 50	3492
	Antares	E.	56 48 9	3087	55 19 43	3085	53 51 15	3084	52 22 46	3082
	α Aquilæ	E.	103 57 4	3925	102 44 10	3914	101 31 4	3903	100 17 47	3893
6	Sun	W.	39 51 45	3462	41 12 52	3454	42 34 7	3448	43 55 29	3442
	Antares	E.	44 59 42	3070	43 30 56	3068	42 2 7	3065	40 33 14	3061
	α Aquilæ	E.	94 9 6	3854	92 54 59	3848	91 40 46	3842	90 26 27	3838
7	Sun	W.	50 44 15	3406	52 6 25	3397	53 28 45	3389	54 51 14	3380
	Antares	E.	33 7 45	3043	31 38 26	3039	30 9 2	3036	28 39 34	3033
	α Aquilæ	E.	84 13 53	3892	82 59 14	3891	81 44 34	3890	80 29 53	3890
8	Sun	W.	61 46 16	3332	63 9 51	3321	64 33 38	3311	65 57 37	3299
	Spica	W.	25 37 41	3037	27 7 8	3018	28 36 58	3001	30 7 9	2985
	α Aquilæ	E.	74 16 47	3834	73 2 20	3839	71 47 58	3845	70 33 42	3853
	Fomalhaut	E.	103 55 38	3133	102 28 8	3120	101 0 23	3109	99 32 24	3097
9	Sun	W.	73 1 5	3236	74 26 31	3224	75 52 14	3209	77 18 13	3193
	Spica	W.	37 43 5	2908	39 15 14	2892	40 47 43	2877	42 20 31	2862
	α Aquilæ	E.	64 24 45	3912	63 11 37	3928	61 58 46	3947	60 46 14	3969
	Fomalhaut	E.	92 8 52	3037	90 39 25	3024	89 9 42	3011	87 39 43	2999
	α Pegasi	E.	110 42 22	3317	109 18 30	3296	107 54 13	3275	106 29 32	3255
10	Sun	W.	84 32 37	3117	86 0 26	3100	87 28 36	3083	88 57 6	3067
	Spica	W.	50 9 32	2783	51 44 22	2766	53 19 34	2750	54 55 7	2733
	α Aquilæ	E.	54 49 58	4126	53 40 21	4168	52 31 25	4216	51 23 14	4270
	Fomalhaut	E.	80 5 51	2934	78 34 15	2921	77 2 23	2908	75 30 14	2895
	Jupiter	E.	89 50 1	2718	88 13 45	2703	86 37 9	2688	85 0 13	2672
	α Pegasi	E.	99 20 21	3159	97 53 23	3141	96 26 3	3124	94 58 22	3105
11	Sun	W.	96 24 57	2977	97 55 39	2958	99 26 44	2939	100 58 13	2920
	Spica	W.	62 58 34	2647	64 36 25	2629	66 14 41	2610	67 53 22	2593
	α Aquilæ	E.	45 56 53	4656	44 55 16	4763	43 55 9	4885	42 56 42	5022
	Fomalhaut	E.	67 45 22	2831	66 11 35	2819	64 37 32	2808	63 3 14	2796
	Jupiter	E.	76 50 11	2591	75 11 4	2574	73 31 33	2557	71 51 39	2539
	α Pegasi	E.	87 34 39	3022	86 4 53	3005	84 34 47	2990	83 4 22	2976
12	Sun	W.	108 41 45	2823	110 15 43	2804	111 50 6	2784	113 24 55	2764
	Spica	W.	76 13 2	2500	77 54 15	2481	79 35 55	2462	81 18 1	2443
	Antares	W.	30 20 14	2517	32 1 4	2494	33 42 25	2474	35 24 15	2453
	Fomalhaut	E.	55 8 19	2750	53 32 45	2744	51 57 3	2738	50 21 14	2735
	Jupiter	E.	63 26 0	2450	61 43 37	2433	60 0 49	2415	58 17 35	2396
	α Pegasi	E.	75 27 51	2909	73 55 44	2898	72 23 23	2887	70 50 48	2879

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
13	Sun	W.	115° 0′ 10″	2744	116° 35′ 51″	2725	118° 11′ 57″	2705	119° 48′ 30″	2687
	Spica	W.	83 0 34	2424	84 43 34	2406	86 27 0	2387	88 10 53	2369
	Antares	W.	37 6 35	2432	38 49 24	2412	40 32 42	2391	42 16 29	2371
	Fomalhaut	E.	48 45 20	2732	47 9 23	2733	45 33 27	2735	43 57 34	2740
	Jupiter	E.	56 33 55	2378	54 49 49	2361	53 5 18	2343	51 20 21	2325
	α Pegasi	E.	69 18 2	2870	67 45 5	2863	66 11 59	2857	64 38 45	2853
	α Arietis	E.	111 0 49	2515	109 19 56	2494	107 38 34	2473	105 56 43	2453
14	Sun	W.	127 57 37	2593	129 36 42	2574	131 16 12	2558	132 56 5	2540
	Spica	W.	96 56 55	2279	98 43 26	2261	100 30 23	2244	102 17 45	2227
	Antares	W.	51 2 29	2276	52 49 4	2258	54 36 6	2240	56 23 34	2222
	Jupiter	E.	42 29 14	2240	40 41 47	2225	38 53 55	2208	37 5 40	2193
	α Pegasi	E.	56 52 0	2860	55 18 50	2869	53 45 51	2881	52 13 8	2897
	α Arietis	E.	97 20 27	2357	95 35 50	2338	93 50 46	2320	92 5 16	2303
15	Antares	W.	65 27 19	2140	67 17 17	2125	69 7 38	2111	70 58 21	2097
	α Arietis	E.	83 11 43	2225	81 23 53	2211	79 35 42	2198	77 47 11	2186
	Aldebaran	E.	113 36 5	2161	111 46 39	2145	109 56 48	2130	108 6 34	2115
16	Antares	W.	80 17 0	2036	82 9 38	2026	84 2 32	2016	85 55 41	2007
	α Aquilæ	W.	43 59 51	4163	45 8 52	4013	46 20 19	3877	47 34 2	3757
	α Arietis	E.	68 40 23	2136	66 50 19	2130	65 0 5	2123	63 9 41	2118
	Aldebaran	E.	98 50 15	2054	96 58 5	2043	95 5 38	2033	93 12 56	2025
17	Antares	W.	95 24 29	1975	97 18 43	1971	99 13 3	1967	101 7 29	1965
	α Aquilæ	W.	54 10 50	3308	55 34 52	3244	57 0 9	3185	58 26 36	3133
	α Arietis	E.	53 56 32	2115	52 5 55	2118	50 15 23	2123	48 24 59	2131
	Aldebaran	E.	83 46 27	1993	81 52 42	1989	79 58 50	1986	78 4 54	1984
18	α Aquilæ	W.	65 52 41	2946	67 24 2	2920	68 55 55	2899	70 28 15	2881
	Fomalhaut	W.	31 11 41	2646	32 49 34	2582	34 28 54	2527	36 9 29	2482
	Jupiter	W.	18 13 6	1992	20 6 53	1984	22 0 52	1979	23 55 0	1975
	Aldebaran	E.	68 34 48	1987	66 40 53	1989	64 47 2	1994	62 53 18	1998
	Pollux	E.	112 37 6	1960	110 42 29	1963	108 47 56	1966	106 53 28	1969
19	α Aquilæ	W.	78 14 25	2835	79 48 8	2833	81 21 53	2834	82 55 37	2838
	Fomalhaut	W.	44 45 18	2348	46 30 7	2335	48 15 15	2326	50 0 37	2319
	Jupiter	W.	33 26 2	1986	35 19 59	1991	37 13 47	1999	39 7 23	2007
	Aldebaran	E.	53 27 5	2039	51 34 31	2049	49 42 13	2061	47 50 14	2073
	Pollux	E.	97 23 0	2000	95 29 26	2009	93 36 5	2018	91 42 59	2028
20	α Aquilæ	W.	90 42 15	2886	92 14 52	2901	93 47 10	2919	95 19 5	2938
	Fomalhaut	W.	58 48 51	2317	60 34 25	2322	62 19 52	2328	64 5 10	2337
	Jupiter	W.	48 31 45	2061	50 23 45	2073	52 15 26	2086	54 6 46	2100
	α Pegasi	W.	42 59 48	3007	44 29 52	2962	46 0 52	2924	47 32 41	2891
	Aldebaran	E.	38 35 45	2154	36 46 8	2174	34 57 2	2196	33 8 29	2220
	Pollux	E.	82 21 37	2086	80 30 17	2100	78 39 18	2114	76 48 40	2129
21	α Aquilæ	W.	102 51 47	3064	104 20 41	3096	105 48 57	3128	107 16 33	3163
	Fomalhaut	W.	72 48 18	2391	74 32 6	2405	76 15 34	2419	77 58 42	2433
	Jupiter	W.	63 17 54	2176	65 6 57	2193	66 55 35	2210	68 43 48	2227
	α Pegasi	W.	55 19 56	2801	56 54 22	2794	58 28 58	2789	60 3 40	2788

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
13	Sun	W.	121° 25′ 28″	2867	123° 2′ 52″	2848	124° 40′ 42″	2829	126° 18′ 57″	2811
	Spica	W.	89 55 12	2350	91 39 58	2332	93 25 11	2314	95 10 50	2296
	Antares	W.	44 0 45	2352	45 45 29	2333	47 30 41	2313	49 16 21	2294
	Fomalhaut	E.	42 21 47	2749	40 46 12	2761	39 10 53	2779	37 35 57	2801
	Jupiter	E.	49 34 58	2306	47 49 10	2290	46 2 56	2273	44 16 17	2257
	α Pegasi	E.	63 5 26	2851	61 32 4	2849	59 58 40	2851	58 25 18	2854
	α Arietis	E.	104 14 24	2433	102 31 37	2413	100 48 21	2394	99 4 38	2375
14	Sun	W.	134 36 22	2525	136 17 1	2508	137 58 3	2493	139 39 23	2477
	Spica	W.	104 5 32	2211	105 53 43	2194	107 42 19	2179	109 31 18	2163
	Antares	W.	58 11 29	2205	59 59 49	2188	61 48 35	2172	63 37 45	2156
	Jupiter	E.	35 17 2	2179	33 28 3	2165	31 38 43	2153	29 49 4	2141
	α Pegasi	E.	50 40 45	2916	49 8 47	2942	47 37 21	2971	46 6 32	3007
	α Arietis	E.	90 19 21	2286	88 33 1	2270	86 46 18	2255	84 59 12	2239
15	Antares	W.	72 49 25	2083	74 40 50	2070	76 32 35	2058	78 24 39	2047
	α Arietis	E.	75 58 22	2174	74 9 15	2163	72 19 52	2153	70 30 14	2145
	Aldebaran	E.	106 15 58	2101	104 25 1	2088	102 33 44	2076	100 42 8	2065
16	Antares	W.	87 49 4	2000	89 42 39	1992	91 36 26	1986	93 30 23	1980
	α Aquilæ	W.	48 49 49	3648	50 7 32	3549	51 27 2	3460	52 48 11	3380
	α Arietis	E.	61 19 10	2115	59 28 34	2113	57 37 54	2112	55 47 13	2112
	Aldebaran	E.	91 20 1	2017	89 26 53	2010	87 33 34	2003	85 40 5	1998
17	Antares	W.	103 1 58	1963	104 56 30	1963	106 51 3	1963	108 45 36	1964
	α Aquilæ	W.	59 54 6	3086	61 22 33	3044	62 51 51	3008	64 21 56	2974
	α Arietis	E.	46 34 47	2140	44 44 49	2153	42 55 10	2167	41 5 53	2184
	Aldebaran	E.	76 10 54	1962	74 16 52	1969	72 22 49	1962	70 28 47	1964
18	α Aquilæ	W.	72 0 58	2866	73 34 0	2854	75 7 18	2845	76 40 47	2838
	Fomalhaut	W.	37 51 8	2444	39 33 40	2412	41 16 58	2386	43 0 53	2365
	Jupiter	W.	25 49 13	1974	27 43 29	1974	29 37 44	1976	31 31 56	1980
	Aldebaran	E.	60 59 41	2005	59 6 14	2012	57 12 58	2020	55 19 55	2028
	Pollux	E.	104 59 5	1974	103 4 50	1979	101 10 43	1986	99 16 46	1993
19	α Aquilæ	W.	84 29 16	2843	86 2 48	2851	87 36 10	2860	89 9 20	2872
	Fomalhaut	W.	51 46 9	2314	53 31 48	2312	55 17 30	2312	57 3 12	2314
	Jupiter	W.	41 0 46	2016	42 53 55	2026	44 46 49	2037	46 39 26	2048
	Aldebaran	E.	45 58 34	2088	44 7 16	2103	42 16 21	2118	40 25 50	2136
	Pollux	E.	89 50 8	2038	87 57 33	2050	86 5 16	2061	84 13 17	2073
20	α Aquilæ	W.	96 50 36	2959	98 21 40	2983	99 52 14	3008	101 22 17	3034
	Fomalhaut	W.	65 50 16	2345	67 35 10	2355	69 19 49	2366	71 4 12	2378
	Jupiter	W.	55 57 45	2115	57 48 22	2130	59 38 36	2145	61 28 27	2161
	α Pegasi	W.	49 5 11	2865	50 38 15	2842	52 11 48	2825	53 45 43	2811
	Aldebaran	E.	31 20 32	2246	29 33 13	2274	27 46 36	2304	26 0 43	2336
	Pollux	E.	74 58 25	2144	73 8 33	2159	71 19 4	2175	69 29 59	2191
21	α Aquilæ	W.	108 43 26	3200	110 9 35	3240	111 34 57	3282	112 59 30	3325
	Fomalhaut	W.	79 41 29	2449	81 23 54	2465	83 5 56	2482	84 47 34	2499
	Jupiter	W.	70 31 35	2245	72 18 56	2262	74 5 52	2279	75 52 22	2296
	α Pegasi	W.	61 38 24	2788	63 13 8	2789	64 47 50	2793	66 22 27	2798

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
21	Pollux	E.	67° 41′ 18″	2208	65° 53′ 2″	2225	64° 5′ 12″	2242	62° 17′ 47″	2260
	Regulus	E.	103 58 35	2217	102 10 33	2235	100 22 57	2251	98 35 46	2269
	Sun	E.	133 50 20	2532	132 9 51	2550	130 29 47	2567	128 50 7	2585
22	Fomalhaut	W.	86 28 48	2517	88 9 37	2535	89 50 2	2553	91 30 1	2572
	Jupiter	W.	77 38 25	2315	79 24 2	2334	81 9 12	2352	82 53 56	2371
	α Pegasi	W.	67 56 57	2805	69 31 18	2813	71 5 29	2822	72 39 28	2832
	α Arietis	W.	24 23 0	2918	25 54 56	2869	27 27 54	2832	29 1 40	2804
	Pollux	E.	53 27 19	2350	51 42 33	2370	49 58 15	2389	48 14 24	2408
	Regulus	E.	89 46 19	2358	88 1 44	2377	86 17 36	2396	84 33 55	2414
	Sun	E.	120 37 55	2677	119 0 44	2696	117 23 59	2716	115 47 40	2735
23	Fomalhaut	W.	99 43 25	2669	101 20 46	2690	102 57 39	2710	104 34 5	2732
	Jupiter	W.	91 30 59	2462	93 13 6	2480	94 54 47	2498	96 36 3	2516
	α Pegasi	W.	80 25 42	2897	81 58 5	2911	83 30 10	2927	85 1 55	2942
	α Arietis	W.	36 56 56	2750	38 32 30	2750	40 8 4	2751	41 43 36	2755
	Pollux	E.	39 41 52	2502	38 0 42	2521	36 19 58	2540	34 39 41	2560
	Regulus	E.	76 2 3	2507	74 20 59	2525	72 40 20	2543	71 0 7	2562
	Sun	E.	107 52 29	2832	106 18 43	2852	104 45 22	2871	103 12 26	2891
24	α Pegasi	W.	92 35 27	3029	94 5 4	3047	95 34 18	3066	97 3 9	3085
	α Arietis	W.	49 39 27	2792	51 14 6	2801	52 48 32	2811	54 22 45	2822
	Aldebaran	W.	18 58 9	2878	20 30 56	2862	22 4 3	2852	23 37 24	2845
	Regulus	E.	62 45 17	2651	61 7 31	2669	59 30 9	2686	57 53 10	2702
	Sun	E.	95 33 49	2984	94 3 16	3001	92 33 5	3019	91 3 16	3037
25	α Arietis	W.	62 10 20	2877	63 43 8	2889	65 15 41	2899	66 48 1	2911
	Aldebaran	W.	31 24 51	2855	32 58 7	2862	34 31 15	2869	36 4 14	2877
	Regulus	E.	49 53 46	2784	48 18 57	2800	46 44 29	2815	45 10 21	2831
	Sun	E.	83 39 29	3120	82 11 44	3136	80 44 18	3151	79 17 10	3166
26	α Arietis	W.	74 26 9	2965	75 57 6	2975	77 27 50	2985	78 58 22	2995
	Aldebaran	W.	43 46 28	2920	45 18 22	2929	46 50 4	2938	48 21 35	2946
	Regulus	E.	37 24 35	2905	35 52 23	2920	34 20 29	2935	32 48 54	2950
	Sun	E.	72 5 51	3236	70 40 24	3248	69 15 12	3261	67 50 15	3273
27	α Arietis	W.	86 27 59	3041	87 57 21	3050	89 26 32	3058	90 55 33	3066
	Aldebaran	W.	55 56 33	2987	57 27 2	2994	58 57 22	3001	60 27 33	3008
	Sun	E.	60 48 52	3328	59 25 13	3338	58 1 45	3347	56 38 28	3356
28	α Arietis	W.	98 18 14	3104	99 46 19	3110	101 14 16	3117	102 42 5	3124
	Aldebaran	W.	67 56 25	3039	69 25 49	3045	70 55 6	3050	72 24 17	3055
	Pollux	W.	23 43 14	3034	25 12 45	3037	26 42 12	3040	28 11 35	3044
	Sun	E.	49 44 33	3397	48 22 13	3405	47 0 2	3412	45 37 59	3418
29	Aldebaran	W.	79 48 47	3076	81 17 26	3079	82 46 1	3082	84 14 32	3085
	Pollux	W.	35 37 26	3060	37 6 25	3063	38 35 20	3065	40 4 12	3069
	Sun	E.	38 49 31	3448	37 28 9	3454	36 6 54	3460	34 45 45	3465
30	Aldebaran	W.	91 36 19	3097	93 4 32	3098	94 32 44	3100	96 0 54	3100
	Pollux	W.	47 27 50	3077	48 56 28	3078	50 25 4	3079	51 53 39	3081
	Sun	E.	28 1 29	3493	26 40 57	3498	25 20 31	3506	24 0 13	3513

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Pollux	E.	60° 30′ 49″	2278	58° 44′ 17″	2296	56° 58′ 11″	2314	55° 12′ 32″	2332
	Regulus	E.	96 49 1	2287	95 2 42	2304	93 16 48	2322	91 31 20	2340
	Sun	E.	127 10 51	2603	125 32 0	2621	123 53 33	2639	122 15 31	2658
22	Fomalhaut	W.	93 9 35	2591	94 48 42	2610	96 27 23	2630	98 5 37	2649
	Jupiter	W.	84 38 13	2389	86 22 4	2408	88 5 28	2426	89 48 26	2443
	α Pegasi	W.	74 13 14	2844	75 46 45	2855	77 20 1	2867	78 53 0	2882
	α Arietis	W.	30 36 3	2783	32 10 53	2768	33 46 3	2758	35 21 26	2753
	Pollux	E.	46 31 0	2426	44 48 3	2445	43 5 33	2464	41 23 29	2483
	Regulus	E.	82 50 40	2432	81 7 51	2451	79 25 29	2470	77 43 33	2488
	Sun	E.	114 11 47	2754	112 36 19	2774	111 1 17	2793	109 26 40	2813
23	Fomalhaut	W.	106 10 3	2753	107 45 33	2773	109 20 36	2795	110 55 11	2817
	Jupiter	W.	98 16 54	2534	99 57 20	2551	101 37 22	2569	103 17 0	2586
	α Pegasi	W.	86 33 20	2959	88 4 24	2976	89 35 7	2993	91 5 28	3011
	α Arietis	W.	43 19 3	2760	44 54 23	2766	46 29 35	2773	48 4 36	2782
	Pollux	E.	32 59 51	2579	31 20 27	2598	29 41 29	2617	28 2 57	2637
	Regulus	E.	69 20 20	2580	67 40 58	2598	66 2 0	2615	64 23 26	2634
	Sun	E.	101 39 55	2909	100 7 48	2928	98 36 5	2946	97 4 45	2965
24	α Pegasi	W.	98 31 37	3105	99 59 41	3124	101 27 21	3144	102 54 37	3164
	α Arietis	W.	55 56 44	2839	57 30 30	2844	59 4 1	2855	60 37 18	2866
	Aldebaran	W.	25 10 53	2842	26 44 26	2843	28 17 58	2845	29 51 27	2849
	Regulus	E.	56 16 33	2719	54 40 18	2736	53 4 26	2752	51 28 55	2769
	Sun	E.	89 33 49	3054	88 4 43	3071	86 35 58	3087	85 7 33	3105
25	α Arietis	W.	68 20 6	2921	69 51 58	2933	71 23 35	2943	72 54 59	2954
	Aldebaran	W.	37 37 2	2885	39 9 40	2894	40 42 7	2902	42 14 23	2911
	Regulus	E.	43 36 33	2846	42 3 5	2861	40 29 56	2876	38 57 6	2891
	Sun	E.	77 50 20	3180	76 23 47	3195	74 57 32	3209	73 31 33	3223
26	α Arietis	W.	80 28 41	3005	81 58 48	3014	83 28 43	3023	84 58 27	3033
	Aldebaran	W.	49 52 56	2954	51 24 6	2963	52 55 5	2971	54 25 54	2979
	Regulus	E.	31 17 39	2965	29 46 43	2981	28 16 6	2997	26 45 50	3014
	Sun	E.	66 25 32	3284	65 1 2	3296	63 36 46	3307	62 12 43	3319
27	α Arietis	W.	92 24 24	3074	93 53 5	3082	95 21 37	3089	96 50 0	3096
	Aldebaran	W.	61 57 36	3015	63 27 30	3022	64 57 16	3028	66 26 54	3034
	Sun	E.	55 15 21	3365	53 52 25	3373	52 29 38	3382	51 7 1	3390
28	α Arietis	W.	104 9 46	3130	105 37 19	3136	107 4 45	3143	108 32 3	3148
	Aldebaran	W.	73 53 22	3060	75 22 21	3064	76 51 15	3069	78 20 3	3072
	Pollux	W.	29 40 53	3047	31 10 7	3051	32 39 17	3054	34 8 23	3056
	Sun	E.	44 16 3	3424	42 54 14	3431	41 32 33	3436	40 10 59	3443
29	Aldebaran	W.	85 43 0	3088	87 11 24	3091	88 39 45	3093	90 8 3	3095
	Pollux	W.	41 33 0	3070	43 1 46	3073	44 30 29	3074	45 59 10	3075
	Sun	E.	33 24 42	3470	32 3 44	3476	30 42 53	3481	29 22 8	3487
30	Aldebaran	W.	97 29 2	3102	98 57 9	3103	100 25 15	3104	101 53 20	3105
	Pollux	W.	53 22 12	3061	54 50 45	3062	56 19 17	3062	57 47 49	3063
	Sun	E.	22 40 3	3521	21 20 2	3531	20 0 12	3542	18 40 34	3556

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	12 29 24.00	9.058	S. 3 10 36.6	–58.28	16 1.35	64.35	10 17.91	0.797
Frid.	2	12 33 1.55	9.071	3 33 54.5	58.20	16 1.62	64.39	10 36.86	0.784
Sat.	3	12 36 39.41	9.084	3 57 10.0	58.09	16 1.90	64.44	10 55.50	0.771
SUN.	4	12 40 17.59	9.098	4 20 22.8	–57.97	16 2.19	64.49	11 13 83	0.757
Mon.	5	12 43 56.11	9.113	4 43 32.5	57.83	16 2.47	64.54	11 31.81	0.742
Tues.	6	12 47 35.00	9.128	5 6 38.6	57.67	16 2.75	64.60	11 49.42	0.727
Wed.	7	12 51 14.27	9.144	5 29 40.9	–57.50	16 3.03	64.66	12 6 66	0.711
Thur.	8	12 54 53.93	9.161	5 52 38.9	57.31	16 3.32	64.72	12 23.51	0.694
Frid.	9	12 58 34.01	9.179	6 15 32.1	57.11	16 3.60	64.79	12 39.94	0.676
Sat.	10	13 2 14.52	9.197	6 38 20.2	–56.89	16 3.88	64.86	12 55.94	0.658
SUN.	11	13 5 55.48	9.216	7 1 2.9	56.66	16 4.16	64.93	13 11.49	0.639
Mon.	12	13 9 36.91	9.236	7 23 39.8	56.41	16 4.44	65.00	13 26.57	0.619
Tues.	13	13 13 18.84	9.257	7 46 10.5	–56.14	16 4.72	65.07	13 41.15	0.598
Wed.	14	13 17 1.27	9.279	8 8 34.6	55.86	16 5.00	65.15	13 55.23	0.576
Thur.	15	13 20 44.23	9.301	8 30 51.9	55.56	16 5.28	65.23	14 8.79	0.554
Frid.	16	13 24 27.74	9.325	8 53 1.9	–55.25	16 5.56	65.31	14 21.79	0.530
Sat.	17	13 28 11.83	9.349	9 15 4.2	54.93	16 5.83	65.40	14 34.23	0.506
SUN.	18	13 31 56.51	9.374	9 36 58.6	54.60	16 6.10	65.49	14 46.07	0.481
Mon.	19	13 35 41.81	9.400	9 58 44.6	–54.24	16 6.37	65.58	14 57.30	0.455
Tues.	20	13 39 27.73	9.427	10 20 21.8	53.87	16 6.64	65.67	15 7.90	0.428
Wed.	21	13 43 14.32	9.455	10 41 49.9	53.48	16 6.90	65.77	15 17.84	0.400
Thur.	22	13 47 1.59	9.483	11 3 8.6	–53.08	16 7.17	65.87	15 27.11	0.372
Frid.	23	13 50 49.54	9.513	11 24 17.6	52.66	16 7.43	65.97	15 35.69	0.343
Sat.	24	13 54 38.20	9.543	11 45 16.4	52.23	16 7.69	66.07	15 43.56	0.313
SUN.	25	13 58 27.59	9.573	12 6 4.5	–51.78	16 7.95	66.17	15 50.71	0.283
Mon.	26	14 2 17.71	9.604	12 26 41.7	51.31	16 8.21	66.27	15 57.13	0.252
Tues.	27	14 6 8.59	9.636	12 47 7.5	50.83	16 8.46	66.38	16 2.79	0.220
Wed.	28	14 10 0.23	9.668	13 7 21.5	–50.32	16 8.71	66.49	16 7.69	0.188
Thur.	29	14 13 52.64	9.700	13 27 23.2	49.80	16 8.96	66.60	16 11.82	0.156
Frid.	30	14 17 45.83	9.733	13 47 12.3	49.26	16 9.21	66.71	16 15.17	0.123
Sat.	31	14 21 39.81	9.766	14 6 48.3	48.71	16 9.46	66.82	16 17.74	0.090
SUN.	32	14 25 34.58	9.799	S. 14 26 10.8	–48.14	16 9.71	66.93	16 19.52	0.057

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	12 29 25.56	9.060	S. 3 10 46.6	−58.30	10 18.04	0.797	12 39 43.60
Frid.	2	12 33 3.16	9.073	3 34 4.8	58.21	10 37.00	0.784	12 43 40.16
Sat.	3	12 36 41.07	9.086	3 57 20.6	58.10	10 55.64	0.771	12 47 36.71
SUN.	4	12 40 19.30	9.100	4 20 33.7	−57.98	11 13.97	0.757	12 51 33.27
Mon.	5	12 43 57.87	9.115	4 43 43.6	57.84	11 31.95	0.742	12 55 29.82
Tues.	6	12 47 36.81	9.130	5 6 50.0	57.68	11 49.56	0.727	12 59 26.37
Wed.	7	12 51 16.12	9.146	5 29 52.5	−57.51	12 6.80	0.711	13 3 22.92
Thur.	8	12 54 55.83	9.163	5 52 50.7	57.32	12 23.65	0.694	13 7 19.48
Frid.	9	12 58 35.95	9.181	6 15 44.1	57.12	12 40.08	0.676	13 11 16.03
Sat.	10	13 2 16.51	9.199	6 38 32.4	−56.90	12 56.08	0.658	13 15 12.59
SUN.	11	13 5 57.51	9.218	7 1 15.3	56.67	13 11.63	0.639	13 19 9.14
Mon.	12	13 9 38.99	9.238	7 23 52.4	56.42	13 26.71	0.619	13 23 5.70
Tues.	13	13 13 20.96	9.259	7 46 23.3	−56.15	13 41.29	0.598	13 27 2.25
Wed.	14	13 17 3.43	9.281	8 8 47.5	55.87	13 55.37	0.576	13 30 58.80
Thur.	15	13 20 46.43	9.303	8 31 4.9	55.57	14 8.92	0.554	13 34 55.35
Frid.	16	13 24 29.98	9.327	8 53 15.0	−55.26	14 21.92	0.530	13 38 51.90
Sat.	17	13 28 14.11	9.351	9 15 17.4	54.94	14 34.35	0.506	13 42 48.46
SUN.	18	13 31 58.83	9.376	9 37 11.9	54.60	14 46.19	0.481	13 46 45.02
Mon.	19	13 35 44.16	9.402	9 58 58.0	−54.24	14 57.41	0.455	13 50 41.57
Tues.	20	13 39 30.12	9.429	10 20 35.3	53.87	15 8.01	0.428	13 54 38.13
Wed.	21	13 43 16.74	9.457	10 42 3.5	53.48	15 17.94	0.400	13 58 34.68
Thur.	22	13 47 4.04	9.485	11 3 22.3	−53.08	15 27.20	0.372	14 2 31.24
Frid.	23	13 50 52.02	9.514	11 24 31.3	52.66	15 35.77	0.343	14 6 27.79
Sat.	24	13 54 40.71	9.544	11 45 30.1	52.23	15 43.64	0.313	14 10 24.35
SUN.	25	13 58 30.12	9.574	12 6 18.2	−51.78	15 50.78	0.283	14 14 20.90
Mon.	26	14 2 20.27	9.605	12 26 55.3	51.31	15 57.19	0.252	14 18 17.46
Tues.	27	14 6 11.17	9.637	12 47 21.1	50.83	16 2.85	0.220	14 22 14.01
Wed.	28	14 10 2.83	9.669	13 7 35.0	−50.32	16 7.74	0.188	14 26 10.57
Thur.	29	14 13 55.26	9.701	13 27 36.6	49.80	16 11.86	0.156	14 30 7.12
Frid.	30	14 17 48.47	9.734	13 47 25.6	49.26	16 15.20	0.123	14 34 3.67
Sat.	31	14 21 42.47	9.767	14 7 1.5	48.71	16 17.76	0.090	14 38 0.23
SUN.	32	14 25 37.26	9.800	S. 14 26 23.9	−48.14	16 19.53	0.057	14 41 56.79

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ'	Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	188 0 59.1	0 36.4	147.68	+ 0.46	0.0002928	−51.7	11 18 24.96
2	275	188 60 4.7	59 41.9	147.77	0.40	0.0001684	52.0	11 14 29.05
3	276	189 59 12.4	58 49.5	147.86	0.31	0.0000433	52.3	11 10 33.14
4	277	190 58 22.1	57 59.1	147.95	+ 0.20	9.9999175	−52.6	11 6 37.23
5	278	191 57 33.7	57 10.6	148.03	+ 0.07	9.9997911	52.8	11 2 41.33
6	279	192 56 47.3	56 24.1	148.10	− 0.06	9.9996643	53.0	10 58 45.42
7	280	193 56 2.8	55 39.5	148.18	− 0.20	9.9995371	−53.1	10 54 49.51
8	281	194 55 20.1	54 56.6	148.25	0.33	9.9994096	53.2	10 50 53.60
9	282	195 54 39.1	54 15.5	148.33	0.44	9.9992819	53.3	10 46 57.69
10	283	196 53 59.8	53 36.1	148.40	− 0.53	9.9991540	−53.2	10 43 1.79
11	284	197 53 22.3	52 58.5	148.47	0.60	9.9990264	53.1	10 39 5.88
12	285	198 52 46.6	52 22.7	148.54	0.65	9.9988992	52.9	10 35 9.97
13	286	199 52 12.7	51 48.7	148.62	− 0.66	9.9987726	−52.6	10 31 14.06
14	287	200 51 40.6	51 16.5	148.69	0.64	9.9986467	52.3	10 27 18.16
15	288	201 51 10.3	50 46.1	148.77	0.59	9.9985215	52.0	10 23 22.25
16	289	202 50 41.9	50 17.6	148.85	− 0.52	9.9983971	−51.6	10 19 26.34
17	290	203 50 15.5	49 51.0	148.93	0.42	9.9982737	51.2	10 15 30.43
18	291	204 49 51.0	49 26.4	149.01	0.30	9.9981514	50.7	10 11 34.53
19	292	205 49 28.5	49 3.8	149.10	− 0.17	9.9980303	−50.2	10 7 38.62
20	293	206 49 8.1	48 43.3	149.19	− 0.04	9.9979103	49.8	10 3 42.71
21	294	207 48 50.0	48 25.0	149.28	+ 0.09	9.9977912	49.4	9 59 46.80
22	295	208 48 34.1	48 9.0	149.37	+ 0.21	9.9976732	−49.0	9 55 50.88
23	296	209 48 20.4	47 55.2	149.47	0.32	9.9975562	48.7	9 51 54.97
24	297	210 48 8.9	47 43.6	149.56	0.40	9.9974401	48.3	9 47 59.06
25	298	211 47 59.7	47 34.3	149.66	+ 0.46	9.9973248	−47.9	9 44 3.15
26	299	212 47 52.7	47 27.2	149.75	0.49	9.9972102	47.6	9 40 7.25
27	300	213 47 47.8	47 22.2	149.84	0.49	9.9970961	47.4	9 36 11.34
28	301	214 47 45.1	47 19.3	149.93	+ 0.46	9.9969825	−47.2	9 32 15.43
29	302	215 47 44.6	47 18.7	150.02	0.40	9.9968694	47.0	9 28 19.52
30	303	216 47 46.2	47 20.2	150.11	0.31	9.9967568	46.8	9 24 23.61
31	304	217 47 49.9	47 23.7	150.19	0.20	9.9966446	46.7	9 20 27.70
32	305	218 47 55.5	47 29.1	150.27	+ 0.08	9.9965327	−46.5	9 16 31.79

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0ᵈ.0.

Diff. for 1 Hour,
— 9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 43.6	14 43.5	53 56.1	−0.10	53 55.7	+0.03	23 33.7	1.65	28.2
2	14 43.7	14 44.4	53 56.6	+0.14	53 58.9	0.25	δ		29.2
3	14 45.3	14 46.6	54 2.4	0.35	54 7.2	0.46	0 13.2	1.66	0.5
4	14 48.3	14 50.3	54 13.3	+0.57	54 20.7	+0.67	0 53.4	1.71	1.5
5	14 52.7	14 55.4	54 29.4	0.79	54 39.5	0.90	1 35.2	1.79	2.5
6	14 58.6	15 2.1	54 51.0	1.02	55 3.9	1.15	2 19.3	1.90	3.5
7	15 6.0	15 10.4	55 18.4	+1.27	55 34.4	+1.40	3 6.6	2.04	4.5
8	15 15.2	15 20.4	55 52.0	1.53	56 11.2	1.66	3 57.5	2.19	5.5
9	15 26.0	15 32.0	56 31.8	1.78	56 53.9	1.90	4 51.8	2.31	6.5
10	15 38.4	15 45.0	57 17.2	+2.00	57 41.7	+2.08	5 48.6	2.39	7.5
11	15 51.9	15 58.9	58 6.9	2.12	58 32.5	2.14	6 46.5	2.40	8.5
12	16 5.8	16 12.7	58 58.1	2.12	59 23.3	2.06	7 44.0	2.36	9.5
13	16 19.2	16 25.3	59 47.3	+1.94	60 9.6	+1.77	8 39.9	2.29	10.5
14	16 30.7	16 35.4	60 29.6	1.55	60 46.6	1.27	9 34.1	2.23	11.5
15	16 39.0	16 41.5	60 59.9	0.94	61 9.1	+0.59	10 26.8	2.19	12.5
16	16 42.8	16 42.7	61 13.8	+0.19	61 13.6	−0.22	11 19.1	2.19	13.5
17	16 41.4	16 38.7	61 8.6	−0.62	60 58.8	1.01	12 11.9	2.23	14.5
18	16 34.8	16 29.8	60 44.5	1.36	60 26.2	1.68	13 6.1	2.29	15.5
19	16 23.9	16 17.1	60 4.3	−1.95	59 39.6	−2.15	14 2.1	2.37	16.5
20	16 9.8	16 2.2	59 12.8	2.30	58 44.6	2.39	14 59.7	2.41	17.5
21	15 54.3	15 46.3	58 15.6	2.42	57 46.5	2.40	15 57.8	2.40	18.5
22	15 38.6	15 31.1	57 18.0	−2.34	56 50.4	−2.24	16 54.8	2.32	19.5
23	15 24.0	15 17.3	56 24.3	2.11	55 59.9	1.96	17 49.2	2.19	20.5
24	15 11.2	15 5.7	55 37.5	1.78	55 17.3	1.59	18 40.0	2.04	21.5
25	15 0.9	14 56.7	54 59.5	−1.39	54 44.1	−1.19	19 27.3	1.90	22.5
26	14 53.1	14 50.3	54 31.0	0.99	54 20.5	0.79	20 11.2	1.78	23.5
27	14 48.1	14 46.4	54 12.2	0.60	54 6.2	0.41	20 52.8	1.70	24.5
28	14 45.3	14 44.9	54 2.4	−0.24	54 0.7	−0.07	21 32.8	1.66	25.5
29	14 44.9	14 45.4	54 0.9	+0.09	54 2.8	+0.23	22 12.3	1.66	26.5
30	14 46.4	14 47.8	54 6.3	0.36	54 11.4	0.48	22 52.3	1.69	27.5
31	14 49.5	14 51.6	54 17.7	0.58	54 25.3	0.68	23 33.6	1.77	28.5
32	14 53.9	14 56.5	54 33.9	+0.77	54 43.6	+0.85	δ		29.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 35 22.53	1.7949	N. 7 44 46.9	12.704	0	13 0 29.70	1.7743	S. 2 44 10.2	13.222
1	11 37 10.17	1.7931	7 32 3.8	12.732	1	13 2 16.19	1.7754	2 57 23.3	13.214
2	11 38 57.71	1.7914	7 19 19.1	12.759	2	13 4 2.75	1.7765	3 10 35.9	13.206
3	11 40 45.14	1.7897	7 6 32.7	12.786	3	13 5 49.37	1.7776	3 23 48.0	13.197
4	11 42 32.47	1.7881	6 53 44.7	12.812	4	13 7 36.06	1.7788	3 36 59.6	13.187
5	11 44 19.71	1.7866	6 40 55.2	12.837	5	13 9 22.83	1.7801	3 50 10.5	13.177
6	11 46 6.86	1.7851	6 28 4.3	12.861	6	13 11 9.67	1.7814	4 3 20.8	13.167
7	11 47 53.92	1.7836	6 15 11.9	12.885	7	13 12 56.60	1.7828	4 16 30.5	13.155
8	11 49 40.89	1.7821	6 2 18.1	12.907	8	13 14 43.61	1.7842	4 29 39.4	13.142
9	11 51 27.77	1.7808	5 49 23.0	12.929	9	13 16 30.71	1.7857	4 42 47.5	13.128
10	11 53 14.58	1.7796	5 36 26.6	12.951	10	13 18 17.90	1.7873	4 55 54.8	13.114
11	11 55 1.32	1.7783	5 23 28.9	12.972	11	13 20 5.19	1.7890	5 9 1.2	13.099
12	11 56 47.98	1.7771	5 10 30.0	12.991	12	13 21 52.58	1.7907	5 22 6.7	13.084
13	11 58 34.57	1.7760	4 57 30.0	13.010	13	13 23 40.07	1.7924	5 35 11.3	13.067
14	12 0 21.10	1.7750	4 44 28.8	13.029	14	13 25 27.67	1.7942	5 48 14.8	13.050
15	12 2 7.57	1.7740	4 31 26.5	13.047	15	13 27 15.37	1.7960	6 1 17.3	13.032
16	12 3 53.98	1.7730	4 18 23.2	13.064	16	13 29 3.19	1.7980	6 14 18.7	13.014
17	12 5 40.33	1.7721	4 5 18.9	13.080	17	13 30 51.13	1.8000	6 27 19.0	12.995
18	12 7 26.63	1.7713	3 52 13.6	13.096	18	13 32 39.19	1.8020	6 40 18.1	12.974
19	12 9 12.89	1.7706	3 39 7.4	13.110	19	13 34 27.37	1.8041	6 53 15.9	12.953
20	12 10 59.10	1.7699	3 26 0.4	13.123	20	13 36 15.68	1.8063	7 6 12.5	12.931
21	12 12 45.27	1.7693	3 12 52.6	13.137	21	13 38 4.13	1.8086	7 19 7.7	12.908
22	12 14 31.41	1.7687	2 59 44.0	13.150	22	13 39 52.71	1.8109	7 32 1.5	12.885
23	12 16 17.51	1.7681	N. 2 46 34.6	13.162	23	13 41 41.43	1.8132	S. 7 44 53.9	12.862
	FRIDAY 2.					**SUNDAY 4.**			
0	12 18 3.58	1.7676	N. 2 33 24.5	13.173	0	13 43 30.29	1.8156	S. 7 57 44.9	12.837
1	12 19 49.63	1.7672	2 20 13.8	13.183	1	13 45 19.29	1.8180	8 10 34.3	12.810
2	12 21 35.65	1.7668	2 7 2.5	13.193	2	13 47 8.45	1.8206	8 23 22.1	12.783
3	12 23 21.65	1.7666	1 53 50.6	13.202	3	13 48 57.76	1.8232	8 36 8.3	12.756
4	12 25 7.64	1.7664	1 40 38.2	13.210	4	13 50 47.23	1.8258	8 48 52.8	12.728
5	12 26 53.62	1.7662	1 27 25.4	13.218	5	13 52 36.86	1.8284	9 1 35.6	12.699
6	12 28 39.59	1.7661	1 14 12.1	13.225	6	13 54 26.64	1.8311	9 14 16.7	12.669
7	12 30 25.55	1.7660	1 0 58.4	13.231	7	13 56 16.59	1.8340	9 26 55.9	12.638
8	12 32 11.51	1.7661	0 47 44.4	13.236	8	13 58 6.72	1.8369	9 39 33.2	12.606
9	12 33 57.48	1.7662	0 34 30.1	13.241	9	13 59 57.02	1.8398	9 52 8.6	12.574
10	12 35 43.45	1.7663	0 21 15.5	13.245	10	14 1 47.49	1.8428	10 4 42.1	12.541
11	12 37 29.43	1.7665	N. 0 8 0.7	13.248	11	14 3 38.15	1.8458	10 17 13.5	12.506
12	12 39 15.43	1.7668	S. 0 5 14.2	13.250	12	14 5 28.99	1.8489	10 29 42.8	12.471
13	12 41 1.45	1.7671	0 18 29.3	13.252	13	14 7 20.02	1.8521	10 42 10.0	12.436
14	12 42 47.48	1.7674	0 31 44.4	13.253	14	14 9 11.24	1.8553	10 54 35.1	12.399
15	12 44 33.53	1.7678	0 44 59.6	13.253	15	14 11 2.65	1.8585	11 6 57.9	12.361
16	12 46 19.61	1.7683	0 58 14.7	13.252	16	14 12 54.26	1.8618	11 19 18.4	12.322
17	12 48 5.73	1.7689	1 11 29.8	13.251	17	14 14 46.07	1.8652	11 31 36.6	12.283
18	12 49 51.88	1.7695	1 24 44.8	13.248	18	14 16 38.09	1.8687	11 43 52.4	12.243
19	12 51 38.07	1.7701	1 37 59.6	13.245	19	14 18 30.31	1.8722	11 56 5.8	12.202
20	12 53 24.30	1.7708	1 51 14.2	13.242	20	14 20 22.75	1.8757	12 8 16.7	12.161
21	12 55 10.57	1.7716	2 4 28.7	13.239	21	14 22 15.40	1.8793	12 20 25.1	12.118
22	12 56 56.89	1.7725	2 17 42.9	13.234	22	14 24 8.27	1.8830	12 32 30.9	12.074
23	12 58 43.27	1.7734	2 30 56.7	13.228	23	14 26 1.36	1.8867	12 44 34.0	12.029
24	13 0 29.70	1.7743	S. 2 44 10.2	13.222	24	14 27 54.67	1.8904	S. 12 56 34.4	11.983

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 27 54.67	1.8904	S. 12 56 34.4	11.983
1	14 29 48.21	1.8942	13 8 32.0	11.937
2	14 31 41.98	1.8981	13 20 26.9	11.891
3	14 33 35.98	1.9020	13 32 18.9	11.843
4	14 35 30.22	1.9060	13 44 8.0	11.793
5	14 37 24.70	1.9101	13 55 54.1	11.743
6	14 39 19.43	1.9142	14 7 37.2	11.692
7	14 41 14.40	1.9183	14 19 17.2	11.640
8	14 43 9.62	1.9225	14 30 54.0	11.588
9	14 45 5.10	1.9267	14 42 27.7	11.535
10	14 47 0.83	1.9310	14 53 58.2	11.480
11	14 48 56.82	1.9353	15 5 25.3	11.424
12	14 50 53.06	1.9396	15 16 49.0	11.367
13	14 52 49.57	1.9441	15 28 9.3	11.310
14	14 54 46.35	1.9486	15 39 26.2	11.252
15	14 56 43.40	1.9531	15 50 39.5	11.192
16	14 58 40.72	1.9577	16 1 49.2	11.132
17	15 0 38.32	1.9623	16 12 55.3	11.070
18	15 2 36.20	1.9670	16 23 57.6	11.007
19	15 4 34.36	1.9717	16 34 56.1	10.944
20	15 6 32.80	1.9764	16 45 50.9	10.881
21	15 8 31.53	1.9812	16 56 41.8	10.816
22	15 10 30.55	1.9861	17 7 28.8	10.749
23	15 12 29.86	1.9909	S. 17 18 11.7	10.681

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 14 29.46	1.9958	S. 17 28 50.5	10.613
1	15 16 29.36	2.0008	17 39 25.2	10.544
2	15 18 29.56	2.0058	17 49 55.8	10.474
3	15 20 30.06	2.0108	18 0 22.1	10.402
4	15 22 30.86	2.0159	18 10 44.1	10.330
5	15 24 31.97	2.0211	18 21 1.7	10.256
6	15 26 33.39	2.0262	18 31 14.8	10.182
7	15 28 35.12	2.0314	18 41 23.5	10.107
8	15 30 37.16	2.0366	18 51 27.6	10.030
9	15 32 39.51	2.0418	19 1 27.1	9.952
10	15 34 42.18	2.0471	19 11 21.9	9.874
11	15 36 45.17	2.0524	19 21 12.0	9.795
12	15 38 48.47	2.0577	19 30 57.3	9.714
13	15 40 52.09	2.0631	19 40 37.7	9.632
14	15 42 56.04	2.0686	19 50 13.2	9.550
15	15 45 0.32	2.0741	19 59 43.7	9.466
16	15 47 4.93	2.0795	20 9 9.1	9.381
17	15 49 9.86	2.0849	20 18 29.4	9.295
18	15 51 15.12	2.0904	20 27 44.5	9.207
19	15 53 20.71	2.0960	20 36 54.3	9.119
20	15 55 26.64	2.1016	20 45 58.8	9.031
21	15 57 32.90	2.1071	20 54 58.0	8.941
22	15 59 39.49	2.1127	21 3 51.7	8.849
23	16 1 46.42	2.1183	21 12 39.9	8.757
24	16 3 53.69	2.1240	S. 21 21 22.6	8.664

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 3 53.69	2.1240	S. 21 21 22.6	8.664
1	16 6 1.30	2.1296	21 29 59.6	8.569
2	16 8 9.24	2.1352	21 38 30.9	8.473
3	16 10 17.52	2.1408	21 46 56.4	8.376
4	16 12 26.14	2.1465	21 55 16.0	8.278
5	16 14 35.10	2.1522	22 3 29.8	8.180
6	16 16 44.40	2.1578	22 11 37.6	8.079
7	16 18 54.04	2.1635	22 19 39.3	7.978
8	16 21 4.02	2.1692	22 27 35.0	7.877
9	16 23 14.35	2.1750	22 35 24.5	7.773
10	16 25 25.02	2.1807	22 43 7.7	7.668
11	16 27 36.03	2.1863	22 50 44.7	7.563
12	16 29 47.38	2.1920	22 58 15.3	7.456
13	16 31 59.07	2.1977	23 5 39.4	7.348
14	16 34 11.10	2.2034	23 12 57.1	7.240
15	16 36 23.48	2.2091	23 20 8.2	7.129
16	16 38 36.20	2.2148	23 27 12.6	7.018
17	16 40 49.26	2.2204	23 34 10.4	6.907
18	16 43 2.65	2.2260	23 41 1.5	6.795
19	16 45 16.38	2.2317	23 47 45.8	6.680
20	16 47 30.45	2.2373	23 54 23.1	6.564
21	16 49 44.86	2.2429	24 0 53.4	6.447
22	16 51 59.60	2.2485	24 7 16.7	6.330
23	16 54 14.68	2.2541	S. 24 13 33.0	6.212

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 56 30.09	2.2596	S. 24 19 42.1	6.092
1	16 58 45.83	2.2651	24 25 44.0	5.971
2	17 1 1.90	2.2706	24 31 38.6	5.849
3	17 3 18.30	2.2760	24 37 25.9	5.727
4	17 5 35.02	2.2814	24 43 5.8	5.603
5	17 7 52.07	2.2868	24 48 38.2	5.478
6	17 10 9.44	2.2922	24 54 3.1	5.352
7	17 12 27.13	2.2975	24 59 20.4	5.225
8	17 14 45.14	2.3028	25 4 30.1	5.097
9	17 17 3.46	2.3080	25 9 32.0	4.967
10	17 19 22.10	2.3132	25 14 26.1	4.837
11	17 21 41.04	2.3183	25 19 12.5	4.707
12	17 24 0.29	2.3233	25 23 51.0	4.575
13	17 26 19.84	2.3284	25 28 21.5	4.442
14	17 28 39.70	2.3335	25 32 44.0	4.307
15	17 30 59.86	2.3384	25 36 58.4	4.172
16	17 33 20.31	2.3433	25 41 4.7	4.037
17	17 35 41.06	2.3482	25 45 2.8	3.900
18	17 38 2.10	2.3531	25 48 52.7	3.762
19	17 40 23.43	2.3578	25 52 34.3	3.623
20	17 42 45.03	2.3624	25 56 7.5	3.483
21	17 45 6.91	2.3670	25 59 32.3	3.343
22	17 47 29.07	2.3715	26 2 48.6	3.202
23	17 49 51.49	2.3759	26 5 56.5	3.060
24	17 52 14.18	2.3803	S. 26 8 55.8	2.916

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 52 14.18	2.3803	S.26 8 55.8	2.916
1	17 54 37.13	2.3847	26 11 46.4	2.772
2	17 57 0.34	2.3890	26 14 28.4	2.627
3	17 59 23.81	2.3932	26 17 1.7	2.482
4	18 1 47.53	2.3973	26 19 26.2	2.335
5	18 4 11.49	2.4013	26 21 41.9	2.187
6	18 6 35.69	2.4053	26 23 48.7	2.039
7	18 9 0.13	2.4092	26 25 46.6	1.890
8	18 11 24.79	2.4129	26 27 35.5	1.740
9	18 13 49.68	2.4166	26 29 15.4	1.589
10	18 16 14.79	2.4203	26 30 46.2	1.438
11	18 18 40.12	2.4239	26 32 8.0	1.287
12	18 21 5.66	2.4273	26 33 20.7	1.135
13	18 23 31.40	2.4307	26 34 24.2	0.981
14	18 25 57.35	2.4341	26 35 18.4	0.827
15	18 28 23.49	2.4372	26 36 3.4	0.672
16	18 30 49.82	2.4403	26 36 39.1	0.517
17	18 33 16.33	2.4433	26 37 5.5	0.362
18	18 35 43.01	2.4462	26 37 22.5	0.205
19	18 38 9.87	2.4491	26 37 30.1	− 0.048
20	18 40 36.90	2.4517	26 37 28.3	+ 0.109
21	18 43 4.08	2.4543	26 37 17.0	0.267
22	18 45 31.42	2.4569	26 36 56.2	0.426
23	18 47 58.91	2.4594	S.26 36 25.9	0.585

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 50 26.55	2.4618	S.26 35 46.0	0.744
1	18 52 54.33	2.4640	26 34 56.6	0.903
2	18 55 22.23	2.4660	26 33 57.6	1.064
3	18 57 50.25	2.4680	26 32 48.9	1.225
4	19 0 18.39	2.4700	26 31 30.6	1.386
5	19 2 46.65	2.4718	26 30 2.6	1.547
6	19 5 15.01	2.4735	26 28 24.9	1.709
7	19 7 43.47	2.4752	26 26 37.5	1.871
8	19 10 12.03	2.4767	26 24 40.4	2.033
9	19 12 40.68	2.4782	26 22 33.5	2.196
10	19 15 9.41	2.4795	26 20 16.9	2.358
11	19 17 38.22	2.4807	26 17 50.5	2.521
12	19 20 7.09	2.4817	26 15 14.4	2.683
13	19 22 36.02	2.4827	26 12 28.5	2.847
14	19 25 5.02	2.4837	26 9 32.8	3.011
15	19 27 34.07	2.4846	26 6 27.2	3.175
16	19 30 3.17	2.4853	26 3 11.8	3.338
17	19 32 32.30	2.4858	25 59 46.7	3.501
18	19 35 1.46	2.4863	25 56 11.7	3.665
19	19 37 30.65	2.4868	25 52 26.9	3.828
20	19 39 59.87	2.4871	25 48 32.3	3.992
21	19 42 29.10	2.4873	25 44 27.9	4.155
22	19 44 58.34	2.4873	25 40 13.7	4.318
23	19 47 27.58	2.4873	25 35 49.7	4.482
24	19 49 56.82	2.4872	S.25 31 15.8	4.646

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 49 56.82	2.4872	S.25 31 15.8	4.646
1	19 52 26.05	2.4871	25 26 32.1	4.809
2	19 54 55.27	2.4868	25 21 38.7	4.971
3	19 57 24.47	2.4865	25 16 35.6	5.134
4	19 59 53.65	2.4860	25 11 22.7	5.297
5	20 2 22.79	2.4854	25 6 0.0	5.459
6	20 4 51.89	2.4847	25 0 27.6	5.621
7	20 7 20.95	2.4840	24 54 45.5	5.782
8	20 9 49.97	2.4832	24 48 53.7	5.944
9	20 12 18.94	2.4823	24 42 52.2	6.105
10	20 14 47.85	2.4813	24 36 41.1	6.266
11	20 17 16.70	2.4802	24 30 20.3	6.427
12	20 19 45.48	2.4791	24 23 49.9	6.586
13	20 22 14.19	2.4779	24 17 10.0	6.745
14	20 24 42.82	2.4766	24 10 20.5	6.904
15	20 27 11.38	2.4752	24 3 21.5	7.063
16	20 29 39.85	2.4737	23 56 13.0	7.221
17	20 32 8.22	2.4721	23 48 55.0	7.378
18	20 34 36.50	2.4705	23 41 27.6	7.535
19	20 37 4.68	2.4688	23 33 50.8	7.691
20	20 39 32.76	2.4671	23 26 4.7	7.847
21	20 42 0.73	2.4652	23 18 9.2	8.003
22	20 44 28.59	2.4633	23 10 4.4	8.156
23	20 46 56.33	2.4614	S.23 1 50.4	8.309

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 49 23.96	2.4595	S.22 53 27.3	8.462
1	20 51 51.47	2.4574	22 44 55.0	8.615
2	20 54 18.85	2.4552	22 36 13.5	8.767
3	20 56 46.09	2.4529	22 27 23.0	8.917
4	20 59 13.20	2.4507	22 18 23.5	9.067
5	21 1 40.18	2.4485	22 9 15.0	9.217
6	21 4 7.02	2.4462	21 59 57.5	9.365
7	21 6 33.72	2.4438	21 50 31.2	9.512
8	21 9 0.27	2.4414	21 40 56.1	9.657
9	21 11 26.68	2.4389	21 31 12.8	9.802
10	21 13 52.94	2.4363	21 21 19.8	9.947
11	21 16 19.04	2.4337	21 11 18.6	10.091
12	21 18 44.98	2.4311	21 1 8.9	10.233
13	21 21 10.77	2.4285	20 50 50.6	10.375
14	21 23 36.40	2.4258	20 40 23.9	10.515
15	21 26 1.87	2.4231	20 29 48.8	10.654
16	21 28 27.18	2.4204	20 19 5.4	10.792
17	21 30 52.32	2.4177	20 8 13.7	10.930
18	21 33 17.30	2.4149	19 57 13.8	11.067
19	21 35 42.11	2.4121	19 46 5.7	11.202
20	21 38 6.75	2.4093	19 34 49.6	11.335
21	21 40 31.23	2.4065	19 23 25.5	11.468
22	21 42 55.53	2.4036	19 11 53.4	11.600
23	21 45 19.66	2.4007	19 0 13.5	11.730
24	21 47 43.62	2.3979	S.18 48 25.8	11.859

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 47 43.62	2.3979	S. 18 48 25.8	11.859
1	21 50 7.41	2.3950	18 36 30.4	11.987
2	21 52 31.02	2.3921	18 24 27.3	12.115
3	21 54 54.46	2.3892	18 12 16.6	12.241
4	21 57 17.72	2.3863	17 59 58.4	12.365
5	21 59 40.81	2.3834	17 47 32.8	12.487
6	22 2 3.73	2.3805	17 34 59.9	12.609
7	22 4 26.47	2.3776	17 22 19.7	12.730
8	22 6 49.04	2.3747	17 9 32.3	12.848
9	22 9 11.43	2.3718	16 56 37.9	12.965
10	22 11 33.65	2.3689	16 43 36.5	13.082
11	22 13 55.70	2.3660	16 30 28.1	13.197
12	22 16 17.57	2.3631	16 17 12.9	13.310
13	22 18 39.27	2.3602	16 3 50.9	13.422
14	22 21 0.80	2.3574	15 50 22.3	13.532
15	22 23 22.16	2.3546	15 36 47.1	13.641
16	22 25 43.35	2.3518	15 23 5.4	13.748
17	22 28 4.38	2.3491	15 9 17.3	13.854
18	22 30 25.24	2.3463	14 55 22.9	13.958
19	22 32 45.93	2.3435	14 41 22.3	14.062
20	22 35 6.46	2.3408	14 27 15.5	14.163
21	22 37 26.83	2.3382	14 13 2.7	14.262
22	22 39 47.04	2.3355	13 58 44.0	14.361
23	22 42 7.09	2.3328	S. 13 44 19.4	14.458

WEDNESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 44 26.98	2.3302	S. 13 29 49.0	14.553
1	22 46 46.72	2.3277	13 15 13.0	14.647
2	22 49 6.30	2.3251	13 0 31.4	14.738
3	22 51 25.73	2.3226	12 45 44.4	14.828
4	22 53 45.01	2.3202	12 30 52.0	14.917
5	22 56 4.15	2.3177	12 15 54.3	15.004
6	22 58 23.14	2.3153	12 0 51.5	15.089
7	23 0 41.99	2.3130	11 45 43.6	15.172
8	23 3 0.70	2.3107	11 30 30.8	15.254
9	23 5 19.27	2.3084	11 15 13.1	15.335
10	23 7 37.70	2.3062	10 59 50.6	15.413
11	23 9 56.01	2.3041	10 44 23.5	15.490
12	23 12 14.19	2.3019	10 28 51.8	15.565
13	23 14 32.24	2.2998	10 13 15.7	15.638
14	23 16 50.17	2.2978	9 57 35.2	15.710
15	23 19 7.98	2.2958	9 41 50.5	15.779
16	23 21 25.67	2.2939	9 26 1.7	15.847
17	23 23 43.25	2.2920	9 10 8.8	15.914
18	23 26 0.71	2.2902	8 54 12.0	15.978
19	23 28 18.07	2.2884	8 38 11.4	16.041
20	23 30 35.32	2.2867	8 22 7.1	16.102
21	23 32 52.47	2.2851	8 5 59.2	16.161
22	23 35 9.53	2.2835	7 49 47.8	16.217
23	23 37 26.49	2.2819	7 33 33.1	16.272
24	23 39 43.36	2.2804	S. 7 17 15.1	16.326

THURSDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 39 43.36	2.2804	S. 7 17 15.1	16.326
1	23 42 0.14	2.2790	7 0 54.0	16.377
2	23 44 16.84	2.2777	6 44 29.8	16.427
3	23 46 33.46	2.2764	6 28 2.7	16.475
4	23 48 50.00	2.2751	6 11 32.8	16.521
5	23 51 6.47	2.2738	5 55 0.2	16.565
6	23 53 22.86	2.2727	5 38 25.0	16.607
7	23 55 39.19	2.2717	5 21 47.3	16.647
8	23 57 55.46	2.2707	5 5 7.3	16.685
9	0 0 11.67	2.2697	4 48 25.1	16.722
10	0 2 27.83	2.2689	4 31 40.7	16.757
11	0 4 43.94	2.2681	4 14 54.3	16.789
12	0 7 0.00	2.2673	3 58 6.0	16.820
13	0 9 16.02	2.2666	3 41 15.9	16.848
14	0 11 32.00	2.2660	3 24 24.2	16.874
15	0 13 47.94	2.2654	3 7 31.0	16.899
16	0 16 3.85	2.2650	2 50 36.3	16.922
17	0 18 19.74	2.2646	2 33 40.3	16.943
18	0 20 35.60	2.2642	2 16 43.1	16.962
19	0 22 51.44	2.2639	1 59 44.8	16.979
20	0 25 7.27	2.2637	1 42 45.6	16.994
21	0 27 23.08	2.2635	1 25 45.5	17.007
22	0 29 38.89	2.2635	1 8 44.7	17.018
23	0 31 54.70	2.2634	S. 0 51 43.3	17.027

FRIDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 34 10.50	2.2634	S. 0 34 41.5	17.033
1	0 36 26.31	2.2636	0 17 39.3	17.039
2	0 38 42.13	2.2638	S. 0 0 36.8	17.042
3	0 40 57.96	2.2640	N. 0 16 25.8	17.043
4	0 43 13.81	2.2643	0 33 28.4	17.042
5	0 45 29.68	2.2647	0 50 30.8	17.038
6	0 47 45.58	2.2652	1 7 33.0	17.033
7	0 50 1.51	2.2657	1 24 34.8	17.027
8	0 52 17.47	2.2662	1 41 36.2	17.018
9	0 54 33.46	2.2668	1 58 37.0	17.007
10	0 56 49.49	2.2676	2 15 37.1	16.994
11	0 59 5.57	2.2684	2 32 36.3	16.979
12	1 1 21.70	2.2692	2 49 34.6	16.962
13	1 3 37.88	2.2702	3 6 31.8	16.943
14	1 5 54.12	2.2712	3 23 27.8	16.922
15	1 8 10.42	2.2722	3 40 22.4	16.898
16	1 10 26.78	2.2732	3 57 15.6	16.873
17	1 12 43.21	2.2744	4 14 7.2	16.847
18	1 14 59.71	2.2756	4 30 57.2	16.818
19	1 17 16.28	2.2769	4 47 45.4	16.787
20	1 19 32.94	2.2783	5 4 31.6	16.753
21	1 21 49.68	2.2797	5 21 15.8	16.718
22	1 24 6.51	2.2812	5 37 57.8	16.682
23	1 26 23.43	2.2827	5 54 37.6	16.643
24	1 28 40.44	2.2843	N. 6 11 15.0	16.602

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					**MONDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 28 40.44	2.2843	N. 6 11 15.0	16.602	0	3 21 1.29	2.4079	N.18 5 3.0	12.462
1	1 30 57.55	2.2860	6 27 49.9	16.559	1	3 23 25.85	2.4108	18 17 26.9	12.335
2	1 33 14.76	2.2877	6 44 22.1	16.514	2	3 25 50.59	2.4138	18 29 43.2	12.207
3	1 35 32.07	2.2894	7 0 51.6	16.467	3	3 28 15.51	2.4167	18 41 51.8	12.078
4	1 37 49.49	2.2912	7 17 18.2	16.418	4	3 30 40.60	2.4196	18 53 52.6	11.947
5	1 40 7.02	2.2931	7 33 41.8	16.367	5	3 33 5.86	2.4225	19 5 45.5	11.815
6	1 42 24.66	2.2950	7 50 2.3	16.315	6	3 35 31.30	2.4253	19 17 30.4	11.681
7	1 44 42.42	2.2970	8 6 19.6	16.260	7	3 37 56.90	2.4281	19 29 7.2	11.547
8	1 47 0.30	2.2991	8 22 33.5	16.203	8	3 40 22.67	2.4309	19 40 36.0	11.412
9	1 49 18.31	2.3012	8 38 44.0	16.145	9	3 42 48.61	2.4337	19 51 56.6	11.274
10	1 51 36.44	2.3033	8 54 50.9	16.084	10	3 45 14.71	2.4364	20 3 8.9	11.136
11	1 53 54.70	2.3055	9 10 54.1	16.023	11	3 47 40.98	2.4391	20 14 12.9	10.997
12	1 56 13.10	2.3077	9 26 53.6	15.959	12	3 50 7.41	2.4418	20 25 8.5	10.856
13	1 58 31.63	2.3100	9 42 49.2	15.892	13	3 52 34.00	2.4444	20 35 55.6	10.714
14	2 0 50.30	2.3123	9 58 40.7	15.823	14	3 55 0.74	2.4469	20 46 34.2	10.571
15	2 3 9.10	2.3146	10 14 28.0	15.753	15	3 57 27.63	2.4494	20 57 4.1	10.427
16	2 5 28.05	2.3171	10 30 11.1	15.682	16	3 59 54.67	2.4519	21 7 25.4	10.282
17	2 7 47.15	2.3195	10 45 49.8	15.608	17	4 2 21.86	2.4543	21 17 38.0	10.136
18	2 10 6.39	2.3219	11 1 24.1	15.533	18	4 4 49.19	2.4567	21 27 41.7	9.989
19	2 12 25.78	2.3245	11 16 53.8	15.456	19	4 7 16.66	2.4590	21 37 36.6	9.841
20	2 14 45.33	2.3271	11 32 18.8	15.376	20	4 9 44.27	2.4613	21 47 22.6	9.692
21	2 17 5.04	2.3297	11 47 38.9	15.294	21	4 12 12.02	2.4636	21 56 59.6	9.542
22	2 19 24.90	2.3323	12 2 54.1	15.212	22	4 14 39.90	2.4657	22 6 27.6	9.391
23	2 21 44.92	2.3350	N.12 18 4.3	15.127	23	4 17 7.90	2.4678	N.22 15 46.5	9.239
	SUNDAY 18.					**TUESDAY 20.**			
0	2 24 5.10	2.3377	N.12 33 9.4	15.041	0	4 19 36.03	2.4698	N.22 24 56.3	9.087
1	2 26 25.44	2.3404	12 48 9.2	14.952	1	4 22 4.28	2.4717	22 33 56.9	8.933
2	2 28 45.95	2.3432	13 3 3.7	14.862	2	4 24 32.64	2.4736	22 42 48.3	8.779
3	2 31 6.63	2.3461	13 17 52.7	14.771	3	4 27 1.11	2.4754	22 51 30.4	8.623
4	2 33 27.48	2.3488	13 32 36.2	14.677	4	4 29 29.69	2.4772	23 0 3.1	8.467
5	2 35 48.49	2.3516	13 47 14.0	14.582	5	4 31 58.37	2.4789	23 8 26.5	8.311
6	2 38 9.67	2.3545	14 1 46.0	14.484	6	4 34 27.16	2.4806	23 16 40.5	8.154
7	2 40 31.03	2.3574	14 16 12.1	14.386	7	4 36 56.04	2.4821	23 24 45.0	7.996
8	2 42 52.56	2.3603	14 30 32.3	14.286	8	4 39 25.01	2.4835	23 32 40.0	7.838
9	2 45 14.27	2.3632	14 44 46.4	14.183	9	4 41 54.06	2.4848	23 40 25.6	7.680
10	2 47 36.15	2.3662	14 58 54.3	14.079	10	4 44 23.19	2.4861	23 48 1.6	7.520
11	2 49 58.21	2.3692	15 12 55.9	13.974	11	4 46 52.40	2.4873	23 55 28.0	7.359
12	2 52 20.45	2.3722	15 26 51.2	13.867	12	4 49 21.67	2.4884	24 2 44.7	7.198
13	2 54 42.87	2.3752	15 40 40.0	13.758	13	4 51 51.01	2.4895	24 9 51.8	7.037
14	2 57 5.47	2.3781	15 54 22.2	13.648	14	4 54 20.41	2.4904	24 16 49.2	6.876
15	2 59 28.24	2.3811	16 7 57.8	13.537	15	4 56 49.86	2.4913	24 23 36.9	6.714
16	3 1 51.19	2.3840	16 21 26.6	13.423	16	4 59 19.36	2.4921	24 30 14.8	6.551
17	3 4 14.32	2.3871	16 34 48.6	13.308	17	5 1 48.91	2.4928	24 36 43.0	6.388
18	3 6 37.64	2.3901	16 48 3.6	13.191	18	5 4 18.49	2.4933	24 43 1.4	6.225
19	3 9 1.14	2.3931	17 1 11.5	13.073	19	5 6 48.10	2.4938	24 49 10.0	6.062
20	3 11 24.81	2.3960	17 14 12.4	12.955	20	5 9 17.74	2.4943	24 55 8.8	5.898
21	3 13 48.66	2.3990	17 27 6.1	12.834	21	5 11 47.41	2.4946	25 0 57.7	5.733
22	3 16 12.69	2.4020	17 39 52.5	12.712	22	5 14 17.09	2.4947	25 6 36.7	5.568
23	3 18 36.90	2.4050	17 52 31.5	12.588	23	5 16 46.77	2.4947	25 12 5.9	5.404
24	3 21 1.29	2.4079	N.18 5 3.0	12.462	24	5 19 16.45	2.4947	N.25 17 25.2	5.239

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 19 16.45	2.4947	N.25 17 25.2	5.239
1	5 21 46.13	2.4946	25 22 34.6	5.074
2	5 24 15.80	2.4944	25 27 34.1	4.909
3	5 26 45.46	2.4942	25 32 23.7	4.744
4	5 29 15.10	2.4938	25 37 3.4	4.578
5	5 31 44.71	2.4932	25 41 33.1	4.413
6	5 34 14.28	2.4925	25 45 53.0	4.249
7	5 36 43.81	2.4918	25 50 3.0	4.084
8	5 39 13.30	2.4910	25 54 3.0	3.918
9	5 41 42.73	2.4900	25 57 53.1	3.752
10	5 44 12.10	2.4890	26 1 33.3	3.587
11	5 46 41.41	2.4878	26 5 3.6	3.423
12	5 49 10.64	2.4866	26 8 24.1	3.259
13	5 51 39.79	2.4852	26 11 34.7	3.094
14	5 54 8.86	2.4838	26 14 35.4	2.929
15	5 56 37.84	2.4822	26 17 26.2	2.765
16	5 59 6.72	2.4804	26 20 7.2	2.602
17	6 1 35.49	2.4786	26 22 38.4	2.438
18	6 4 4.15	2.4767	26 24 59.7	2.274
19	6 6 32.70	2.4747	26 27 11.2	2.111
20	6 9 1.12	2.4726	26 29 13.0	1.949
21	6 11 29.41	2.4704	26 31 5.1	1.787
22	6 13 57.56	2.4681	26 32 47.4	1.624
23	6 16 25.58	2.4657	N.26 34 20.0	1.463

THURSDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 18 53.45	2.4632	N.26 35 43.0	1.302
1	6 21 21.16	2.4605	26 36 56.3	1.142
2	6 23 48.71	2.4578	26 38 0.0	0.982
3	6 26 16.10	2.4550	26 38 54.1	0.823
4	6 28 43.31	2.4520	26 39 38.7	0.664
5	6 31 10.34	2.4490	26 40 13.8	0.505
6	6 33 37.19	2.4459	26 40 39.3	0.347
7	6 36 3.85	2.4427	26 40 55.4	0.190
8	6 38 30.31	2.4393	26 41 2.1	+ 0.033
9	6 40 56.57	2.4359	26 40 59.4	− 0.122
10	6 43 22.62	2.4324	26 40 47.4	0.277
11	6 45 48.46	2.4288	26 40 26.1	0.432
12	6 48 14.08	2.4252	26 39 55.5	0.586
13	6 50 39.48	2.4214	26 39 15.7	0.739
14	6 53 4.65	2.4175	26 38 26.8	0.892
15	6 55 29.58	2.4135	26 37 28.7	1.044
16	6 57 54.27	2.4095	26 36 21.5	1.195
17	7 0 18.72	2.4055	26 35 5.3	1.344
18	7 2 42.93	2.4013	26 33 40.2	1.493
19	7 5 6.88	2.3970	26 32 6.1	1.642
20	7 7 30.57	2.3927	26 30 23.1	1.790
21	7 9 54.00	2.3882	26 28 31.3	1.937
22	7 12 17.16	2.3837	26 26 30.7	2.082
23	7 14 40.05	2.3792	26 24 21.4	2.227
24	7 17 2.66	2.3745	N.26 22 3.4	2.372

FRIDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 17 2.66	2.3745	N.26 22 3.4	2.372
1	7 19 24.99	2.3698	26 19 36.8	2.515
2	7 21 47.04	2.3651	26 17 1.6	2.657
3	7 24 8.80	2.3602	26 14 17.9	2.799
4	7 26 30.27	2.3553	26 11 25.7	2.940
5	7 28 51.44	2.3503	26 8 25.1	3.079
6	7 31 12.31	2.3453	26 5 16.2	3.218
7	7 33 32.88	2.3403	26 1 59.0	3.356
8	7 35 53.14	2.3352	25 58 33.5	3.492
9	7 38 13.10	2.3300	25 54 59.9	3.627
10	7 40 32.74	2.3247	25 51 18.2	3.762
11	7 42 52.07	2.3195	25 47 28.4	3.897
12	7 45 11.08	2.3142	25 43 30.6	4.030
13	7 47 29.77	2.3088	25 39 24.8	4.162
14	7 49 48.13	2.3033	25 35 11.2	4.292
15	7 52 6.17	2.2979	25 30 49.8	4.421
16	7 54 23.88	2.2924	25 26 20.7	4.550
17	7 56 41.26	2.2869	25 21 43.8	4.678
18	7 58 58.31	2.2813	25 16 59.3	4.804
19	8 1 15.02	2.2757	25 12 7.3	4.930
20	8 3 31.39	2.2701	25 7 7.7	5.055
21	8 5 47.43	2.2645	25 2 0.7	5.178
22	8 8 3.13	2.2588	24 56 46.4	5.300
23	8 10 18.49	2.2531	N.24 51 24.7	5.422

SATURDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 12 33.50	2.2473	N.24 45 55.7	5.543
1	8 14 48.17	2.2416	24 40 19.5	5.662
2	8 17 2.49	2.2358	24 34 36.2	5.780
3	8 19 16.47	2.2301	24 28 45.9	5.897
4	8 21 30.10	2.2243	24 22 48.6	6.013
5	8 23 43.38	2.2184	24 16 44.3	6.128
6	8 25 56.31	2.2126	24 10 33.2	6.242
7	8 28 8.89	2.2067	24 4 15.3	6.355
8	8 30 21.12	2.2009	23 57 50.6	6.467
9	8 32 33.00	2.1951	23 51 19.2	6.578
10	8 34 44.53	2.1892	23 44 41.2	6.687
11	8 36 55.71	2.1833	23 37 56.7	6.796
12	8 39 6.53	2.1774	23 31 5.7	6.903
13	8 41 17.00	2.1716	23 24 8.3	7.010
14	8 43 27.13	2.1658	23 17 4.5	7.116
15	8 45 36.90	2.1599	23 9 54.4	7.221
16	8 47 46.32	2.1541	23 2 38.0	7.324
17	8 49 55.39	2.1482	22 55 15.5	7.426
18	8 52 4.11	2.1424	22 47 46.9	7.527
19	8 54 12.48	2.1366	22 40 12.3	7.627
20	8 56 20.50	2.1308	22 32 31.6	7.727
21	8 58 28.18	2.1251	22 24 45.0	7.826
22	9 0 35.51	2.1193	22 16 52.5	7.923
23	9 2 42.49	2.1135	22 8 54.3	8.018
24	9 4 49.13	2.1077	N.22 0 50.4	8.113

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	9 4 49.13	2.1077	N.22 0 50.4	8.113
1	9 6 55.42	2.1020	21 52 40.8	8.208
2	9 9 1.37	2.0963	21 44 25.5	8.301
3	9 11 6.98	2.0907	21 36 4.7	8.393
4	9 13 12.25	2.0850	21 27 38.4	8.483
5	9 15 17.18	2.0794	21 19 6.7	8.572
6	9 17 21.78	2.0738	21 10 29.7	8.661
7	9 19 26.04	2.0682	21 1 47.4	8.749
8	9 21 29.97	2.0627	20 52 59.8	8.837
9	9 23 33.56	2.0571	20 44 7.0	8.923
10	9 25 36.82	2.0516	20 35 9.1	9.008
11	9 27 39.76	2.0462	20 26 6.1	9.092
12	9 29 42.37	2.0408	20 16 58.1	9.174
13	9 31 44.66	2.0354	20 7 45.2	9.256
14	9 33 46.62	2.0300	19 58 27.4	9.337
15	9 35 48.26	2.0247	19 49 4.7	9.418
16	9 37 49.58	2.0194	19 39 37.2	9.497
17	9 39 50.59	2.0142	19 30 5.1	9.574
18	9 41 51.29	2.0091	19 20 28.3	9.651
19	9 43 51.68	2.0039	19 10 46.9	9.728
20	9 45 51.76	1.9988	19 1 0.9	9.804
21	9 47 51.53	1.9937	18 51 10.4	9.878
22	9 49 51.00	1.9887	18 41 15.5	9.952
23	9 51 50.17	1.9836	N.18 31 16.2	10.024

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 53 49.03	1.9786	N.18 21 12.6	10.096
1	9 55 47.60	1.9737	18 11 4.7	10.167
2	9 57 45.88	1.9689	18 0 52.6	10.236
3	9 59 43.87	1.9641	17 50 36.4	10.305
4	10 1 41.57	1.9594	17 40 16.0	10.374
5	10 3 38.99	1.9547	17 29 51.5	10.441
6	10 5 36.13	1.9500	17 19 23.1	10.507
7	10 7 32.99	1.9453	17 8 50.7	10.572
8	10 9 29.57	1.9407	16 58 14.4	10.637
9	10 11 25.88	1.9362	16 47 34.3	10.700
10	10 13 21.92	1.9318	16 36 50.4	10.763
11	10 15 17.70	1.9274	16 26 2.7	10.826
12	10 17 13.21	1.9230	16 15 11.3	10.887
13	10 19 8.46	1.9187	16 4 16.3	10.947
14	10 21 3.46	1.9145	15 53 17.7	11.006
15	10 22 58.20	1.9103	15 42 15.6	11.064
16	10 24 52.69	1.9061	15 31 10.0	11.122
17	10 26 46.93	1.9020	15 20 0.9	11.180
18	10 28 40.93	1.8980	15 8 48.4	11.237
19	10 30 34.69	1.8940	14 57 32.5	11.292
20	10 32 28.21	1.8900	14 46 13.4	11.345
21	10 34 21.49	1.8861	14 34 51.1	11.398
22	10 36 14.54	1.8823	14 23 25.6	11.451
23	10 38 7.37	1.8786	14 11 56.9	11.504
24	10 39 59.98	1.8750	N.14 0 25.1	11.556

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 39 59.98	1.8750	N.14 0 25.1	11.556
1	10 41 52.37	1.8713	13 48 50.2	11.606
2	10 43 44.54	1.8677	13 37 12.4	11.655
3	10 45 36.49	1.8641	13 25 31.6	11.704
4	10 47 28.23	1.8606	13 13 47.9	11.752
5	10 49 19.77	1.8572	13 2 1.3	11.800
6	10 51 11.10	1.8538	12 50 11.9	11.846
7	10 53 2.23	1.8506	12 38 19.8	11.892
8	10 54 53.17	1.8474	12 26 24.9	11.937
9	10 56 43.92	1.8443	12 14 27.3	11.982
10	10 58 34.48	1.8412	12 2 27.1	12.025
11	11 0 24.86	1.8381	11 50 24.3	12.068
12	11 2 15.05	1.8351	11 38 18.9	12.111
13	11 4 5.07	1.8322	11 26 11.0	12.152
14	11 5 54.91	1.8293	11 14 0.7	12.192
15	11 7 44.58	1.8264	11 1 48.0	12.232
16	11 9 34.08	1.8237	10 49 32.9	12.271
17	11 11 23.42	1.8210	10 37 15.5	12.309
18	11 13 12.60	1.8183	10 24 55.8	12.347
19	11 15 1.62	1.8157	10 12 33.8	12.384
20	11 16 50.49	1.8133	10 0 9.7	12.420
21	11 18 39.22	1.8109	9 47 43.4	12.456
22	11 20 27.80	1.8085	9 35 15.0	12.490
23	11 22 16.24	1.8063	N. 9 22 44.6	12.524

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 24 4.55	1.8041	N. 9 10 12.1	12.558
1	11 25 52.73	1.8018	8 57 37.6	12.591
2	11 27 40.77	1.7996	8 45 1.2	12.623
3	11 29 28.68	1.7975	8 32 22.9	12.654
4	11 31 16.47	1.7956	8 19 42.7	12.684
5	11 33 4.15	1.7937	8 7 0.8	12.713
6	11 34 51.71	1.7918	7 54 17.1	12.743
7	11 36 39.16	1.7899	7 41 31.6	12.772
8	11 38 26.50	1.7882	7 28 44.5	12.799
9	11 40 13.74	1.7865	7 15 55.7	12.826
10	11 42 0.88	1.7849	7 3 5.3	12.852
11	11 43 47.93	1.7833	6 50 13.4	12.878
12	11 45 34.88	1.7817	6 37 19.9	12.904
13	11 47 21.74	1.7804	6 24 24.9	12.928
14	11 49 8.52	1.7791	6 11 28.5	12.951
15	11 50 55.23	1.7778	5 58 30.8	12.974
16	11 52 41.86	1.7765	5 45 31.7	12.996
17	11 54 28.41	1.7753	5 32 31.3	13.017
18	11 56 14.89	1.7741	5 19 29.6	13.038
19	11 58 1.30	1.7731	5 6 26.7	13.058
20	11 59 47.66	1.7722	4 53 22.6	13.078
21	12 1 33.96	1.7712	4 40 17.3	13.097
22	12 3 20.20	1.7704	4 27 10.9	13.115
23	12 5 6.40	1.7696	4 14 3.5	13.132
24	12 6 52.55	1.7688	N. 4 0 55.1	13.148

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 6 52.55	1.7686	N. 4 0 55.1	13.148
1	12 8 38.65	1.7681	3 47 45.7	13.164
2	12 10 24.72	1.7676	3 34 35.4	13.180
3	12 12 10.76	1.7671	3 21 24.1	13.195
4	12 13 56.77	1.7666	3 8 12.0	13.209
5	12 15 42.75	1.7661	2 54 59.1	13.222
6	12 17 28.70	1.7657	2 41 45.4	13.234
7	12 19 14.63	1.7654	2 28 31.0	13.246
8	12 21 0.55	1.7652	2 15 15.9	13.257
9	12 22 46.46	1.7651	2 2 0.2	13.267
10	12 24 32.36	1.7650	1 48 43.8	13.277
11	12 26 18.26	1.7649	1 35 26.9	13.286
12	12 28 4.15	1.7649	1 22 9.5	13.294
13	12 29 50.05	1.7651	1 8 51.6	13.302
14	12 31 35.96	1.7652	0 55 33.3	13.309
15	12 33 21.88	1.7654	0 42 14.5	13.316
16	12 35 7.81	1.7657	0 28 55.4	13.321
17	12 36 53.76	1.7661	0 15 36.0	13.325
18	12 38 39.74	1.7666	N. 0 2 16.4	13.329
19	12 40 25.75	1.7670	S. 0 11 3.5	13.332
20	12 42 11.78	1.7674	0 24 23.5	13.335
21	12 43 57.84	1.7680	0 37 43.7	13.337
22	12 45 43.94	1.7687	0 51 4.0	13.338
23	12 47 30.09	1.7695	S. 1 4 24.3	13.338

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 49 16.28	1.7703	S. 1 17 44.6	13.338
1	12 51 2.52	1.7712	1 31 4.9	13.337
2	12 52 48.82	1.7721	1 44 25.1	13.336
3	12 54 35.17	1.7730	1 57 45.2	13.333
4	12 56 21.58	1.7741	2 11 5.1	13.330
5	12 58 8.06	1.7752	2 24 24.8	13.326
6	12 59 54.60	1.7763	2 37 44.2	13.321
7	13 1 41.21	1.7775	2 51 3.3	13.316
8	13 3 27.90	1.7789	3 4 22.1	13.311
9	13 5 14.68	1.7803	3 17 40.6	13.304
10	13 7 1.54	1.7817	3 30 58.6	13.296
11	13 8 48.48	1.7831	3 44 16.1	13.287
12	13 10 35.51	1.7847	3 57 33.0	13.278
13	13 12 22.64	1.7863	4 10 49.4	13.268
14	13 14 9.87	1.7879	4 24 5.2	13.257
15	13 15 57.19	1.7896	4 37 20.3	13.246
16	13 17 44.62	1.7914	4 50 34.7	13.233
17	13 19 32.16	1.7933	5 3 48.3	13.220
18	13 21 19.82	1.7952	5 17 1.1	13.207
19	13 23 7.59	1.7972	5 30 13.1	13.192
20	13 24 55.48	1.7992	5 43 24.1	13.176
21	13 26 43.50	1.8014	5 56 34.2	13.160
22	13 28 31.65	1.8036	6 9 43.3	13.143
23	13 30 19.93	1.8058	6 22 51.4	13.126
24	13 32 8.34	1.8080	S. 6 35 58.4	13.107

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 32 8.34	1.8080	S. 6 35 58.4	13.107
1	13 33 56.89	1.8104	6 49 4.3	13.087
2	13 35 45.59	1.8128	7 2 8.9	13.067
3	13 37 34.43	1.8152	7 15 12.3	13.046
4	13 39 23.42	1.8177	7 28 14.4	13.024
5	13 41 12.56	1.8203	7 41 15.2	13.002
6	13 43 1.86	1.8230	7 54 14.6	12.978
7	13 44 51.32	1.8257	8 7 12.6	12.954
8	13 46 40.95	1.8285	8 20 9.1	12.928
9	13 48 30.74	1.8313	8 33 4.0	12.902
10	13 50 20.70	1.8342	8 45 57.3	12.875
11	13 52 10.84	1.8372	8 58 49.0	12.847
12	13 54 1.16	1.8402	9 11 39.0	12.818
13	13 55 51.66	1.8432	9 24 27.2	12.789
14	13 57 42.35	1.8463	9 37 13.7	12.759
15	13 59 33.22	1.8494	9 49 58.3	12.727
16	14 1 24.28	1.8527	10 2 41.0	12.695
17	14 3 15.54	1.8560	10 15 21.7	12.662
18	14 5 7.00	1.8593	10 28 0.4	12.627
19	14 6 58.66	1.8627	10 40 37.0	12.592
20	14 8 50.53	1.8662	10 53 11.5	12.557
21	14 10 42.61	1.8697	11 5 43.9	12.521
22	14 12 34.90	1.8733	11 18 14.0	12.483
23	14 14 27.41	1.8769	S. 11 30 41.8	12.444

SUNDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 16 20.13	1.8806	S. 11 43 7.3	12.405

PHASES OF THE MOON.

			d	h	m
●	New Moon . .	Oct.	2	12	57.8
☽	First Quarter		10	10	56.7
○	Full Moon		17	1	45.0
☾	Last Quarter		24	1	56.1

			d	h
☾	Apogee	Oct.	1	9.8
☾	Perigee		16	5.4
☾	Apogee		28	16.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
4	Sun	W.	16 6 48	3516	17 26 54	3497	18 47 22	3480	20 8 9	3463
	Antares	E.	41 56 34	3047	40 27 19	3043	38 58 0	3040	37 28 37	3038
	α Aquilæ	E.	91 40 17	3835	90 25 51	3831	89 11 21	3827	87 56 47	3825
	Fomalhaut	E.	123 50 0	3276	122 25 21	3265	121 0 28	3253	119 35 21	3241
5	Sun	W.	26 55 57	3405	28 18 8	3394	29 40 31	3386	31 3 4	3376
	Antares	E.	30 0 53	3024	28 31 10	3022	27 1 25	3022	25 31 39	3020
	α Aquilæ	E.	81 43 31	3822	80 28 52	3825	79 14 16	3827	77 59 42	3831
	Fomalhaut	E.	112 26 34	3190	111 0 13	3180	109 33 40	3171	108 6 56	3162
6	Sun	W.	37 58 28	3331	39 22 4	3321	40 45 51	3313	42 9 48	3302
	α Aquilæ	E.	71 48 12	3866	70 34 18	3877	69 20 35	3889	68 7 4	3902
	Fomalhaut	E.	100 50 33	3117	99 22 44	3109	97 54 45	3100	96 26 35	3091
	Jupiter	E.	108 31 45	2918	106 59 49	2911	105 27 44	2903	103 55 29	2896
7	Sun	W.	49 12 27	3253	50 37 34	3242	52 2 54	3231	53 28 26	3220
	α Aquilæ	E.	62 3 27	3997	60 51 44	4023	59 40 27	4051	58 29 38	4083
	Fomalhaut	E.	89 3 4	3047	87 33 50	3039	86 4 25	3030	84 34 49	3021
	Jupiter	E.	96 11 45	2855	94 38 28	2845	93 4 59	2837	91 31 19	2827
	α Pegasi	E.	107 56 10	3313	106 32 14	3297	105 7 59	3282	103 43 26	3267
8	Sun	W.	60 39 29	3162	62 6 24	3148	63 33 35	3136	65 1 1	3123
	α Aquilæ	E.	52 44 14	4296	51 37 18	4353	50 31 14	4417	49 26 8	4488
	Fomalhaut	E.	77 4 6	2977	75 33 25	2969	74 2 33	2960	72 31 30	2951
	Jupiter	E.	83 39 45	2776	82 4 46	2765	80 29 32	2753	78 54 3	2742
	α Pegasi	E.	96 36 23	3196	95 10 9	3183	93 43 39	3170	92 16 54	3158
9	Sun	W.	72 22 16	3054	73 51 22	3039	75 20 47	3024	76 50 30	3009
	Antares	W.	20 3 23	2765	21 38 37	2742	23 14 21	2722	24 50 32	2701
	Fomalhaut	E.	64 53 37	2912	63 21 33	2904	61 49 19	2898	60 16 57	2891
	Jupiter	E.	70 52 46	2681	69 15 41	2669	67 38 19	2655	66 0 39	2641
	α Pegasi	E.	84 59 27	3099	83 31 16	3087	82 2 51	3078	80 34 14	3068
	α Arietis	E.	127 45 58	2845	126 12 28	2826	124 38 34	2807	123 4 15	2788
10	Sun	W.	84 23 52	2930	85 55 33	2914	87 27 34	2897	88 59 57	2880
	Antares	W.	32 57 46	2612	34 36 25	2595	36 15 27	2577	37 54 53	2561
	Fomalhaut	E.	52 33 19	2869	51 0 21	2867	49 27 20	2867	47 54 19	2869
	Jupiter	E.	57 47 41	2572	56 8 8	2559	54 28 16	2543	52 48 3	2529
	α Pegasi	E.	73 8 17	3026	71 38 36	3018	70 8 46	3013	68 38 49	3009
	α Arietis	E.	115 6 34	2696	113 29 49	2679	111 52 41	2661	110 15 9	2643
11	Sun	W.	96 47 16	2795	98 21 51	2777	99 56 49	2760	101 32 10	2742
	Antares	W.	46 17 55	2475	47 59 43	2458	49 41 55	2441	51 24 31	2425
	Jupiter	E.	44 21 51	2455	42 39 34	2441	40 56 57	2426	39 13 58	2412
	α Pegasi	E.	61 8 3	3001	59 37 52	3004	58 7 44	3009	56 37 43	3016
	α Arietis	E.	102 1 30	2556	100 21 35	2539	98 41 16	2522	97 0 33	2504
12	Sun	W.	109 34 44	2655	111 12 25	2637	112 50 30	2620	114 28 58	2603
	Antares	W.	60 3 30	2341	61 48 30	2324	63 33 55	2307	65 19 44	2291
	Jupiter	E.	30 34 4	2343	28 49 7	2331	27 3 53	2322	25 18 25	2313
	α Pegasi	E.	49 10 56	3097	47 42 43	3124	46 15 3	3158	44 48 4	3196
	α Arietis	E.	88 31 4	2422	86 48 0	2406	85 4 34	2391	83 20 46	2375

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
4	Sun	W.	21° 29′ 14″	3450	22° 50′ 34″	3437	24° 12′ 9″	3426	25° 33′ 57″	3415
	Antares	E.	35 59 11	3035	34 29 42	3032	33 0 9	3030	31 30 33	3026
	α Aquilæ	E.	86 42 11	3822	85 27 32	3821	84 12 52	3820	82 58 11	3821
	Fomalhaut	E.	118 10 0	3231	116 44 27	3220	115 18 41	3209	113 52 43	3200
5	Sun	W.	32 25 48	3367	33 48 42	3358	35 11 47	3349	36 35 2	3339
	Antares	E.	24 1 51	3020	22 32 3	3022	21 2 17	3023	19 32 33	3026
	α Aquilæ	E.	76 45 12	3836	75 30 47	3842	74 16 28	3849	73 2 16	3856
	Fomalhaut	E.	106 40 1	3153	105 12 55	3143	103 45 38	3135	102 18 11	3126
6	Sun	W.	43 33 57	3293	44 58 17	3282	46 22 49	3273	47 47 32	3263
	α Aquilæ	E.	66 53 46	3918	65 40 44	3934	64 27 59	3953	63 15 33	3973
	Fomalhaut	E.	94 58 14	3082	93 29 42	3073	92 1 0	3065	90 32 7	3056
	Jupiter	E.	102 23 5	2888	100 50 31	2880	99 17 46	2872	97 44 51	2863
7	Sun	W.	54 54 11	3209	56 20 10	3198	57 46 22	3186	59 12 48	3173
	α Aquilæ	E.	57 19 20	4117	56 9 35	4156	55 0 27	4198	53 51 59	4244
	Fomalhaut	E.	83 5 2	3012	81 35 4	3004	80 4 56	2994	78 34 36	2986
	Jupiter	E.	89 57 26	2818	88 23 21	2807	86 49 2	2797	85 14 30	2787
	α Pegasi	E.	102 18 36	3252	100 53 28	3237	99 28 3	3223	98 2 21	3209
8	Sun	W.	66 28 43	3110	67 56 41	3096	69 24 56	3082	70 53 27	3068
	α Aquilæ	E.	48 22 5	4565	47 19 10	4651	46 17 29	4747	45 17 9	4855
	Fomalhaut	E.	71 0 16	2943	69 28 52	2935	67 57 17	2927	66 25 32	2919
	Jupiter	E.	77 18 19	2731	75 42 20	2719	74 6 5	2707	72 29 34	2694
	α Pegasi	E.	90 49 54	3145	89 22 39	3133	87 55 9	3121	86 27 25	3110
9	Sun	W.	78 20 31	2993	79 50 52	2978	81 21 32	2962	82 52 32	2946
	Antares	W.	26 27 10	2683	28 4 13	2665	29 41 40	2647	31 19 31	2629
	Fomalhaut	E.	58 44 27	2885	57 11 49	2880	55 39 5	2875	54 6 14	2872
	Jupiter	E.	64 22 40	2628	62 44 23	2615	61 5 48	2601	59 26 54	2587
	α Pegasi	E.	79 5 25	3058	77 36 24	3049	76 7 12	3040	74 37 49	3033
	α Arietis	E.	121 29 31	2769	119 54 23	2751	118 18 51	2733	116 42 55	2714
10	Sun	W.	90 32 41	2863	92 5 47	2847	93 39 14	2829	95 13 4	2812
	Antares	W.	39 34 42	2543	41 14 55	2527	42 55 31	2510	44 36 31	2492
	Fomalhaut	E.	46 21 21	2873	44 48 27	2878	43 15 40	2887	41 43 4	2897
	Jupiter	E.	51 7 30	2514	49 26 36	2499	47 45 22	2485	46 3 47	2470
	α Pegasi	E.	67 8 47	3005	65 38 40	3001	64 8 29	3000	62 38 16	3000
	α Arietis	E.	108 37 13	2626	106 58 53	2608	105 20 9	2591	103 41 1	2574
11	Sun	W.	103 7 54	2725	104 44 1	2707	106 20 32	2689	107 57 26	2672
	Antares	W.	53 7 30	2408	54 50 54	2391	56 34 42	2374	58 18 54	2357
	Jupiter	E.	37 30 40	2397	35 47 1	2383	34 3 2	2369	32 18 43	2355
	α Pegasi	E.	55 7 50	3026	53 38 9	3039	52 8 44	3054	50 39 38	3073
	α Arietis	E.	95 19 26	2488	93 37 56	2471	91 56 2	2455	90 13 45	2438
12	Sun	W.	116 7 49	2586	117 47 3	2569	119 26 40	2553	121 6 40	2537
	Antares	W.	67 5 56	2275	68 52 32	2260	70 39 31	2243	72 26 54	2229
	Jupiter	E.	23 32 44	2306	21 46 53	2300	20 0 54	2297	18 14 50	2296
	α Pegasi	E.	43 21 52	3245	41 56 36	3300	40 32 24	3366	39 9 27	3443
	α Arietis	E.	81 36 36	2361	79 52 5	2346	78 7 12	2332	76 21 59	2317

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
12	Aldebaran	E.	118° 56′ 26″	2365	117° 12′ 1″	2348	115° 27′ 12″	2331	113° 41′ 58″	2315
13	Sun	W.	122 47 2	2521	124 27 46	2506	126 8 51	2490	127 50 18	2476
	Antares	W.	74 14 39	2213	76 2 47	2198	77 51 17	2184	79 40 9	2170
	α Arietis	E.	74 36 25	2304	72 50 32	2292	71 4 21	2280	69 17 52	2268
	Aldebaran	E.	104 49 47	2234	103 2 10	2219	101 14 11	2204	99 25 50	2190
14	Antares	W.	88 49 38	2105	90 40 30	2094	92 31 39	2083	94 23 5	2072
	α Aquilæ	W.	49 36 0	3723	50 52 23	3627	52 10 28	3539	53 30 9	3458
	α Arietis	E.	60 21 29	2221	58 33 33	2215	56 45 28	2210	54 57 15	2206
	Aldebaran	E.	90 18 52	2124	88 28 30	2113	86 37 51	2102	84 46 55	2092
15	Antares	W.	103 44 3	2028	105 36 53	2022	107 29 53	2016	109 23 3	2010
	α Aquilæ	W.	60 28 57	3149	61 56 7	3104	63 24 12	3061	64 53 9	3024
	Fomalhaut	W.	25 31 55	3080	27 0 29	2944	28 31 52	2831	30 5 40	2735
	α Arietis	E.	45 55 19	2207	44 7 2	2214	42 18 55	2223	40 31 1	2235
	Aldebaran	E.	75 28 38	2050	73 36 21	2044	71 43 55	2039	69 51 21	2033
	Pollux	E.	119 33 48	2025	117 40 52	2018	115 47 46	2012	113 54 30	2006
16	α Aquilæ	W.	72 28 9	2887	74 0 45	2869	75 33 44	2854	77 7 2	2841
	Fomalhaut	W.	38 20 31	2441	40 3 8	2405	41 46 36	2374	43 30 48	2348
	Jupiter	W.	29 0 20	2003	30 53 49	1998	32 47 26	1995	34 41 8	1993
	Aldebaran	E.	60 27 3	2023	58 34 4	2023	56 41 5	2025	54 48 9	2027
	Pollux	E.	104 26 19	1989	102 32 27	1988	100 38 34	1987	98 44 40	1987
17	α Aquilæ	W.	84 56 35	2815	86 30 43	2817	88 4 49	2821	89 38 50	2828
	Fomalhaut	W.	52 19 27	2270	54 6 11	2262	55 53 6	2257	57 40 9	2253
	Jupiter	W.	44 9 50	2000	46 3 25	2003	47 56 54	2009	49 50 15	2015
	α Pegasi	W.	37 36 41	3231	39 2 13	3139	40 29 35	3060	41 58 34	2991
	Aldebaran	E.	45 25 0	2056	43 32 53	2066	41 41 1	2076	39 49 25	2088
	Pollux	E.	89 15 43	2001	87 22 11	2007	85 28 48	2013	83 35 34	2019
18	α Aquilæ	W.	97 25 53	2892	98 58 22	2912	100 30 26	2934	102 2 2	2958
	Fomalhaut	W.	66 35 51	2260	68 22 49	2266	70 9 38	2273	71 56 17	2281
	Jupiter	W.	59 14 16	2056	61 6 23	2066	62 58 14	2077	64 49 48	2090
	α Pegasi	W.	49 41 15	2773	51 16 18	2747	52 51 55	2727	54 27 59	2710
	Pollux	E.	74 12 22	2063	72 20 26	2075	70 28 48	2086	68 37 28	2098
	Regulus	E.	110 29 21	2076	108 37 45	2087	106 46 26	2098	104 55 24	2110
19	Fomalhaut	W.	80 46 3	2337	82 31 9	2350	84 15 55	2365	86 0 20	2381
	Jupiter	W.	74 2 46	2157	75 52 18	2173	77 41 26	2188	79 30 11	2205
	α Pegasi	W.	62 32 35	2672	64 9 53	2671	65 47 12	2673	67 24 28	2677
	Pollux	E.	59 25 44	2168	57 36 28	2184	55 47 36	2200	53 59 8	2216
	Regulus	E.	95 45 3	2178	93 56 2	2194	92 7 25	2209	90 19 11	2225
20	Fomalhaut	W.	94 36 31	2468	96 18 29	2487	98 0 0	2507	99 41 3	2527
	Jupiter	W.	88 27 42	2291	90 13 54	2309	91 59 40	2328	93 44 59	2346
	α Pegasi	W.	75 28 48	2719	77 5 3	2731	78 41 2	2744	80 16 43	2759
	α Arietis	W.	31 52 54	2626	33 31 13	2617	35 9 45	2611	36 48 25	2608
	Pollux	E.	45 3 6	2304	43 17 12	2323	41 31 46	2342	39 46 48	2361
	Regulus	E.	81 24 11	2312	79 38 29	2331	77 53 14	2349	76 8 26	2367
	Sun	E.	139 53 43	2624	138 15 21	2643	136 37 25	2662	134 59 53	2681

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
12	Aldebaran	E.	111° 56′ 20″	2298	110° 10′ 17″	2282	108° 23′ 51″	2266	106° 37′ 1″	2249
13	Sun	W.	129 32 5	2461	131 14 13	2448	132 56 40	2434	134 39 26	2422
	Antares	W.	81 29 22	2156	83 18 56	2142	85 8 51	2130	86 59 5	2117
	α Arietis	E.	67 31 5	2258	65 44 3	2247	63 56 45	2237	62 9 13	2228
	Aldebaran	E.	97 37 7	2176	95 48 3	2163	93 58 39	2149	92 8 55	2137
14	Antares	W.	96 14 48	2062	98 6 46	2052	99 58 59	2044	101 51 25	2036
	α Aquilæ	W.	54 51 20	3385	56 13 54	3318	57 37 45	3256	59 2 48	3200
	α Arietis	E.	53 8 56	2203	51 20 33	2201	49 32 7	2202	47 43 42	2208
	Aldebaran	E.	82 55 44	2083	81 4 18	2073	79 12 37	2064	77 20 43	2057
15	Antares	W.	111 16 21	2006	113 9 46	2002	115 3 17	1999	116 56 53	1997
	α Aquilæ	W.	66 22 52	2989	67 53 18	2959	69 24 22	2932	70 56 0	2908
	Fomalhaut	W.	31 41 33	2656	33 19 12	2588	34 58 23	2531	36 38 53	2482
	α Arietis	E.	38 43 25	2250	36 56 12	2269	35 9 27	2293	33 23 17	2322
	Aldebaran	E.	67 58 39	2030	66 5 51	2026	64 12 58	2025	62 20 2	2023
	Pollux	E.	112 1 5	2001	110 7 32	1997	108 13 53	1993	106 20 8	1991
16	α Aquilæ	W.	78 40 37	2831	80 14 25	2823	81 48 23	2818	83 22 27	2815
	Fomalhaut	W.	45 15 38	2326	47 1 0	2306	48 46 48	2293	50 32 58	2280
	Jupiter	W.	36 34 53	1993	38 28 39	1993	40 22 25	1994	42 16 9	1996
	Aldebaran	E.	52 55 17	2030	51 2 30	2035	49 9 51	2041	47 17 20	2048
	Pollux	E.	96 50 46	1989	94 56 54	1991	93 3 6	1994	91 9 22	1997
17	α Aquilæ	W.	91 12 42	2836	92 46 23	2846	94 19 51	2859	95 53 2	2875
	Fomalhaut	W.	59 27 17	2252	61 14 27	2251	63 1 38	2253	64 48 47	2256
	Jupiter	W.	51 43 26	2021	53 36 27	2028	55 29 17	2037	57 21 54	2046
	α Pegasi	W.	43 28 58	2933	45 0 35	2883	46 33 16	2840	48 6 52	2804
	Aldebaran	E.	37 58 7	2101	36 7 10	2116	34 16 36	2134	32 26 29	2155
	Pollux	E.	81 42 30	2027	79 49 38	2035	77 56 59	2044	76 4 33	2053
18	α Aquilæ	W.	103 33 8	2984	105 3 41	3013	106 33 38	3044	108 2 56	3078
	Fomalhaut	W.	73 42 44	2291	75 28 57	2300	77 14 56	2312	79 0 38	2324
	Jupiter	W.	66 41 3	2102	68 31 59	2115	70 22 36	2128	72 12 52	2143
	α Pegasi	W.	56 4 26	2695	57 41 12	2686	59 18 11	2678	60 55 20	2674
	Pollux	E.	66 46 26	2111	64 55 44	2125	63 5 23	2139	61 15 23	2153
	Regulus	E.	103 4 40	2122	101 14 15	2136	99 24 10	2149	97 34 26	2163
19	Fomalhaut	W.	87 44 22	2397	89 28 1	2414	91 11 16	2431	92 54 6	2449
	Jupiter	W.	81 18 31	2221	83 6 27	2238	84 53 58	2256	86 41 3	2273
	α Pegasi	W.	69 1 39	2683	70 38 42	2689	72 15 36	2696	73 52 18	2707
	Pollux	E.	52 11 4	2233	50 23 26	2250	48 36 13	2268	46 49 26	2286
	Regulus	E.	88 31 20	2241	86 43 54	2259	84 56 54	2276	83 10 19	2294
20	Fomalhaut	W.	101 21 38	2548	103 1 44	2569	104 41 21	2591	106 20 28	2614
	Jupiter	W.	95 29 51	2365	97 14 16	2384	98 58 14	2403	100 41 44	2422
	α Pegasi	W.	81 52 5	2774	83 27 7	2789	85 1 49	2807	86 36 8	2826
	α Arietis	W.	38 27 9	2606	40 5 53	2610	41 44 34	2615	43 23 9	2620
	Pollux	E.	38 2 17	2380	36 18 14	2401	34 34 40	2420	32 51 34	2440
	Regulus	E.	74 24 4	2387	72 40 10	2405	70 56 43	2425	69 13 44	2445
	Sun	E.	133 22 48	2701	131 46 9	2720	130 9 56	2741	128 34 10	2761

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
21	Fomalhaut	W.	107 59 4	2636	109 37 10	2660	111 14 44	2683	112 51 47	2707
	JUPITER	W.	102 24 47	2442	104 7 22	2461	105 49 30	2480	107 31 11	2499
	α Pegasi	W.	88 10 4	2843	89 43 36	2862	91 16 44	2881	92 49 27	2901
	α Arietis	W.	45 1 37	2628	46 39 54	2636	48 18 0	2646	49 55 52	2658
	Pollux	E.	31 8 56	2460	29 26 47	2482	27 45 8	2502	26 3 58	2524
	Regulus	E.	67 31 13	2464	65 49 9	2484	64 7 33	2503	62 26 24	2522
	SUN	E.	126 58 51	2781	125 23 58	2801	123 49 32	2821	122 15 32	2842
22	α Pegasi	W.	100 26 21	3011	101 56 20	3034	103 25 50	3059	104 54 50	3082
	α Arietis	W.	58 1 2	2724	59 37 10	2738	61 12 59	2753	62 48 29	2766
	Aldebaran	W.	27 20 16	2728	28 56 19	2732	30 32 16	2740	32 8 3	2749
	Regulus	E.	54 7 27	2621	52 29 0	2640	50 51 0	2660	49 13 26	2679
	SUN	E.	114 32 3	2942	113 0 38	2962	111 29 38	2981	109 59 2	3001
23	α Pegasi	W.	112 12 12	3214	113 38 4	3242	115 3 23	3271	116 28 8	3301
	α Arietis	W.	70 41 13	2841	72 14 48	2855	73 48 4	2869	75 21 2	2884
	Aldebaran	W.	40 3 38	2805	41 37 59	2817	43 12 5	2829	44 45 55	2842
	Regulus	E.	41 12 1	2775	39 37 0	2793	38 2 23	2812	36 28 11	2831
	SUN	E.	102 31 57	3094	101 3 40	3112	99 35 45	3129	98 8 11	3146
24	α Arietis	W.	83 1 20	2953	84 32 32	2966	86 3 27	2978	87 34 7	2991
	Aldebaran	W.	52 31 1	2904	54 3 15	2916	55 35 14	2927	57 6 59	2939
	Regulus	E.	28 43 22	2929	27 11 40	2950	25 40 25	2973	24 9 38	2997
	SUN	E.	90 55 17	3225	89 29 38	3240	88 4 16	3254	86 39 11	3269
25	α Arietis	W.	95 3 39	3049	96 32 51	3060	98 1 50	3070	99 30 36	3080
	Aldebaran	W.	64 42 15	2990	66 12 40	3000	67 42 53	3009	69 12 55	3017
	Pollux	W.	20 26 31	2985	21 57 3	2991	23 27 27	2998	24 57 42	3005
	SUN	E.	79 37 38	3330	78 14 1	3341	76 50 37	3352	75 27 26	3362
26	α Arietis	W.	106 51 31	3126	108 19 9	3134	109 46 37	3143	111 13 55	3150
	Aldebaran	W.	76 40 36	3055	78 9 41	3060	79 38 39	3066	81 7 30	3072
	Pollux	W.	32 26 53	3037	33 56 20	3043	35 25 40	3048	36 54 53	3053
	SUN	E.	68 34 10	3405	67 11 59	3412	65 49 56	3419	64 28 1	3425
27	Aldebaran	W.	88 30 12	3093	89 58 30	3097	91 26 43	3100	92 54 53	3103
	Pollux	W.	44 19 35	3073	45 48 18	3076	47 16 57	3078	48 45 33	3081
	SUN	E.	57 40 1	3450	56 18 41	3454	54 57 25	3456	53 36 12	3460
28	Aldebaran	W.	100 15 2	3110	101 42 59	3110	103 10 56	3111	104 38 52	3112
	Pollux	W.	56 8 2	3086	57 36 29	3087	59 4 55	3087	60 33 21	3086
	Regulus	W.	20 16 38	3201	21 42 46	3188	23 9 10	3175	24 35 49	3165
	SUN	E.	46 50 48	3468	45 29 48	3468	44 8 48	3468	42 47 48	3468
29	Aldebaran	W.	111 58 35	3108	113 26 35	3107	114 54 36	3105	116 22 40	3103
	Pollux	W.	67 55 49	3078	69 24 25	3077	70 53 3	3074	72 21 44	3071
	Regulus	W.	31 51 44	3127	33 19 21	3121	34 47 5	3115	36 14 56	3110
	SUN	E.	36 2 38	3463	34 41 32	3460	33 20 23	3458	31 59 12	3455
30	Pollux	W.	79 46 6	3054	81 15 12	3051	82 44 22	3046	84 13 38	3042
	Regulus	W.	43 35 53	3082	45 4 25	3077	46 33 3	3070	48 1 49	3065
	SUN	E.	25 12 31	3440	23 51 0	3438	22 29 26	3434	21 7 48	3431

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
21	Fomalhaut W.	114° 28′ 17″	2732	116° 4′ 15″	2756	117° 39′ 40″	2780	119° 14′ 31″	2806
	JUPITER W.	109 12 25	2519	110 53 12	2538	112 33 32	2557	114 13 26	2577
	α Pegasi W.	94 21 44	2922	95 53 35	2944	97 24 58	2965	98 55 54	2989
	α Arietis W.	51 33 28	2670	53 10 48	2683	54 47 51	2696	56 24 36	2709
	Pollux E.	24 23 18	2545	22 43 8	2568	21 3 29	2591	19 24 22	2615
	Regulus E.	60 45 42	2542	59 5 27	2562	57 25 40	2582	55 46 20	2601
	SUN E.	120 41 58	2862	119 8 50	2883	117 36 9	2902	116 3 53	2923
22	α Pegasi W.	106 23 21	3106	107 51 21	3133	109 18 50	3160	110 45 47	3187
	α Arietis W.	64 23 41	2782	65 58 33	2796	67 33 6	2811	69 7 19	2826
	Aldebaran W.	33 43 38	2759	35 19 0	2769	36 54 8	2781	38 29 1	2793
	Regulus E.	47 36 18	2698	45 59 36	2717	44 23 19	2736	42 47 27	2756
	SUN E.	108 28 50	3020	106 59 2	3039	105 29 37	3058	104 0 36	3076
23	α Pegasi W.	117 52 18	3332	119 15 52	3364	120 38 50	3396	122 1 11	3430
	α Arietis W.	76 53 41	2898	78 26 2	2912	79 58 6	2926	81 29 52	2940
	Aldebaran W.	46 19 28	2855	47 52 45	2867	49 25 46	2880	50 58 31	2891
	Regulus E.	34 54 25	2851	33 21 1	2869	31 48 3	2889	30 15 30	2909
	SUN E.	96 40 57	3163	95 14 3	3179	93 47 29	3195	92 21 14	3210
24	α Arietis W.	89 4 31	3003	90 34 40	3015	92 4 34	3026	93 34 14	3039
	Aldebaran W.	58 38 29	2950	60 9 45	2960	61 40 48	2970	63 11 38	2981
	Regulus E.	22 39 22	3033	21 9 38	3059	19 40 29	3088	18 11 58	3118
	SUN E.	85 14 23	3282	83 49 50	3294	82 25 32	3306	81 1 28	3319
25	α Arietis W.	100 59 10	3090	102 27 32	3099	103 55 43	3109	105 23 42	3117
	Aldebaran W.	70 42 47	3026	72 12 28	3033	73 42 0	3041	75 11 22	3047
	Pollux W.	26 27 49	3012	27 57 47	3018	29 27 37	3025	30 57 19	3031
	SUN E.	74 4 26	3372	72 41 37	3381	71 18 59	3389	69 56 30	3397
26	α Arietis W.	112 41 4	3158	114 8 3	3165	115 34 54	3173	117 1 36	3179
	Aldebaran W.	82 36 14	3077	84 4 52	3082	85 33 24	3087	87 1 50	3090
	Pollux W.	38 24 0	3058	39 53 1	3062	41 21 57	3066	42 50 48	3069
	SUN E.	63 6 13	3431	61 44 31	3437	60 22 56	3441	59 1 26	3446
27	Aldebaran W.	94 22 59	3105	95 51 3	3107	97 19 4	3108	98 47 4	3110
	Pollux W.	50 14 6	3082	51 42 37	3083	53 11 7	3085	54 39 35	3086
	SUN E.	52 15 3	3462	50 53 56	3464	49 32 52	3465	48 11 49	3467
28	Aldebaran W.	106 6 47	3111	107 34 43	3111	109 2 39	3110	110 30 37	3110
	Pollux W.	62 1 48	3085	63 30 16	3084	64 58 45	3082	66 27 16	3081
	Regulus W.	26 2 40	3156	27 29 42	3148	28 56 54	3140	30 24 15	3134
	SUN E.	41 26 48	3467	40 5 47	3466	38 44 45	3465	37 23 42	3464
29	Aldebaran W.	117 50 46	3101	119 18 54	3099	120 47 5	3097	122 15 18	3095
	Pollux W.	73 50 29	3069	75 19 17	3065	76 48 9	3062	78 17 5	3058
	Regulus W.	37 42 54	3104	39 10 59	3099	40 39 10	3093	42 7 28	3087
	SUN E.	30 37 58	3453	29 16 41	3450	27 55 21	3447	26 33 58	3444
30	Pollux W.	85 42 59	3037	87 12 26	3033	88 41 58	3027	90 11 37	3022
	Regulus W.	49 30 41	3060	50 59 40	3053	52 28 47	3047	53 58 1	3041
	SUN E.	19 46 6	3498	18 24 21	3494	17 2 32	3493	15 40 41	3490

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	14 25 34.58	9.799	S. 14 26 10.8	–48.14	16 9.71	66.93	16 19.52	0.057
Mon.	2	14 29 30 16	9.833	14 45 19.4	47.56	16 9.96	67.05	16 20.49	0.023
Tues.	3	14 33 26.55	9.867	15 4 13.6	46.95	16 10.21	67.16	16 20.65	0.010
Wed.	4	14 37 23.75	9.901	15 22 52.9	–46.32	16 10.46	67.28	16 20.01	0.044
Thur.	5	14 41 21.76	9.934	15 41 17.0	45.68	16 10.71	67.40	16 18.56	0.077
Frid.	6	14 45 20.59	9.968	15 59 25.4	45.02	16 10.95	67.52	16 16.29	0.111
Sat.	7	14 49 20.24	10.002	16 17 17.7	–44.34	16 11.19	67.64	16 13.20	0.145
SUN.	8	14 53 20.72	10.036	16 34 53.5	43.64	16 11.43	67.76	16 9.29	0.180
Mon.	9	14 57 22.02	10.070	16 52 12.4	42.93	16 11.67	67.88	16 4.55	0.214
Tues.	10	15 1 24.16	10.106	17 9 14.0	–42.20	16 11.90	68.00	15 58.98	0.249
Wed.	11	15 5 27.13	10.141	17 25 57.9	41.45	16 12.14	68.12	15 52.58	0.283
Thur.	12	15 9 30.94	10.176	17 42 23.7	40.69	16 12.36	68.24	15 45.35	0.318
Frid.	13	15 13 35.58	10.211	17 58 31.1	–39.91	16 12.58	68.36	15 37.29	0.353
Sat.	14	15 17 41.06	10.246	18 14 19.5	39.11	16 12.80	68.48	15 28.39	0.388
SUN.	15	15 21 47.38	10.281	18 29 48.7	38.30	16 13.02	68.60	15 18.66	0.423
Mon.	16	15 25 54.54	10.316	18 44 58.4	–37.47	16 13.23	68.71	15 8.09	0.458
Tues.	17	15 30 2.55	10.351	18 59 48.1	36.63	16 13.43	68.83	14 56.66	0.493
Wed.	18	15 34 11.40	10.386	19 14 17.4	35.78	16 13.63	68.94	14 44.40	0.528
Thur.	19	15 38 21.09	10.421	19 28 26.1	–34.91	16 13.83	69.06	14 31.31	0.563
Frid.	20	15 42 31.61	10.455	19 42 13.8	34.03	16 14.03	69.17	14 17.39	0.597
Sat.	21	15 46 42.96	10.489	19 55 40.0	33.13	16 14.22	69.28	14 2.64	0.631
SUN.	22	15 50 55.14	10.523	20 8 44.4	–32.23	16 14.40	69.39	13 47.06	0.665
Mon.	23	15 55 8.13	10.557	20 21 26.8	31.30	16 14.58	69.50	13 30.67	0.699
Tues.	24	15 59 21.91	10.591	20 33 46.8	30.35	16 14.75	69.61	13 13.49	0.732
Wed.	25	16 3 36.49	10.624	20 45 44.0	–29.39	16 14.92	69.72	12 55.52	0.765
Thur.	26	16 7 51.85	10.656	20 57 18.1	28.42	16 15.09	69.82	12 36.77	0.797
Frid.	27	16 12 7.96	10.687	21 8 28.6	27.43	16 15.26	69.92	12 17.27	0.828
Sat.	28	16 16 24.80	10.717	21 19 15.1	–26.43	16 15.42	70.02	11 57.04	0.858
SUN.	29	16 20 42.37	10.746	21 29 37.5	25.42	16 15.58	70.11	11 36.09	0.887
Mon.	30	16 25 0.64	10.775	21 39 35.4	24.39	16 15.74	70.20	11 14.43	0.916
Tues.	31	16 29 19.58	10.802	S. 21 49 8.5	–23.35	16 15.89	70.29	10 52.11	0.943

Note.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	14 25 37.26	9.800	S. 14 26 23.9	−48.14	16 19.53	0.057	14 41 56.79
Mon.	2	14 29 32.85	9.834	14 45 32.3	47.55	16 20.49	0.023	14 45 53.34
Tues.	3	14 33 29.25	9.867	15 4 26.3	46.94	16 20.64	0.010	14 49 49.89
Wed.	4	14 37 26.46	9.901	15 23 5.5	−46.31	16 19.99	0.044	14 53 46.45
Thur.	5	14 41 24.48	9.934	15 41 29.4	45.67	16 18.53	0.077	14 57 43.01
Frid.	6	14 45 23.31	9.968	15 59 37.6	45.01	16 16.25	0.111	15 1 39.56
Sat.	7	14 49 22.96	10.002	16 17 29.7	−44.33	16 13.15	0.145	15 5 36.11
SUN.	8	14 53 23.44	10.037	16 35 5.3	43.63	16 9.23	0.180	15 9 32.67
Mon.	9	14 57 24.74	10.071	16 52 23.9	42.92	16 4.49	0.214	15 13 29.23
Tues.	10	15 1 26.87	10.106	17 9 25.3	−42.19	15 58.91	0.249	15 17 25.78
Wed.	11	15 5 29.84	10.141	17 26 8.9	41.44	15 52.50	0.283	15 21 22.34
Thur.	12	15 9 33.63	10.175	17 42 34.4	40.68	15 45.26	0.318	15 25 18.89
Frid.	13	15 13 38.26	10.210	17 58 41.4	−39.90	15 37.19	0.353	15 29 15.45
Sat.	14	15 17 43.72	10.245	18 14 29.6	39.10	15 28.29	0.388	15 33 12.01
SUN.	15	15 21 50.02	10.280	18 29 58.5	38.29	15 18.55	0.423	15 37 8.57
Mon.	16	15 25 57.16	10.315	18 45 7.8	−37.46	15 7.97	0.458	15 41 5.13
Tues.	17	15 30 5.14	10.350	18 59 57.2	36.62	14 56.54	0.493	15 45 1.68
Wed.	18	15 34 13.96	10.385	19 14 26.2	35.77	14 44.27	0.528	15 48 58.23
Thur.	19	15 38 23 62	10.420	19 28 34.6	−34.90	14 31.17	0.563	15 52 54.79
Frid.	20	15 42 34.11	10.454	19 42 21.9	34.02	14 17.24	0.597	15 56 51.35
Sat.	21	15 46 45.42	10.488	19 55 47.8	33.12	14 2.48	0.631	16 0 47.90
SUN.	22	15 50 57.56	10.522	20 8 51.9	−32.21	13 46.90	0.665	16 4 44.46
Mon.	23	15 55 10.51	10.556	20 21 33.8	31.28	13 30.51	0.699	16 8 41.02
Tues.	24	15 59 24.25	10.589	20 33 53.4	30.34	13 13.33	0.732	16 12 37.58
Wed.	25	16 3 38.78	10.622	20 45 50.3	−29.38	12 55.36	0.765	16 16 34.14
Thur.	26	16 7 54.09	10.654	20 57 24.0	28.41	12 36.61	0.797	16 20 30.70
Frid.	27	16 12 10.15	10.685	21 8 34.1	27.42	12 17.10	0.828	16 24 27.25
Sat.	28	16 16 26.94	10.715	21 19 20.3	−26.42	11 56.87	0.858	16 28 23.81
SUN.	29	16 20 44.45	10.744	21 29 42.4	25.41	11 35.92	0.887	16 32 20.37
Mon.	30	16 25 2.66	10.773	21 39 40.0	24.38	11 14.26	0.916	16 36 16.92
Tues.	31	16 29 21.54	10.800	S. 21 49 12.7	−23.34	10 51.94	0.943	16 40 13.48

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
1	305	218° 47′ 55″.5	47′ 29″.1	150″.27	+ 0″.08	9.9965327	−46.5	9h 16m 31s.79
2	306	219 48 3.0	47 36.5	150.35	− 0.05	9.9964211	46.4	9 12 35.88
3	307	220 48 12.3	47 45.7	150.42	0.18	9.9963100	46.2	9 8 39.97
4	308	221 48 23.3	47 56.5	150.49	− 0.31	9.9961994	−46.0	9 4 44.06
5	309	222 48 35.8	48 8.9	150.56	0.43	9.9960894	45.7	9 0 48.15
6	310	223 48 49.9	48 22.8	150.62	0.53	9.9959802	45.4	8 56 52.24
7	311	224 49 5.6	48 38.4	150.68	− 0.60	9.9958718	−45.0	8 52 56.34
8	312	225 49 22.8	48 55.5	150.74	0.65	9.9957643	44.6	8 49 0.43
9	313	226 49 41.4	49 14.0	150.80	0.67	9.9956580	44.0	8 45 4.52
10	314	227 50 1.4	49 33.8	150.86	− 0.66	9.9955531	−43.4	8 41 8.61
11	315	228 50 22.9	49 55.1	150.92	0.62	9.9954497	42.7	8 37 12.70
12	316	229 50 45.7	50 17.8	150.98	0.55	9.9953479	42.0	8 33 16.79
13	317	230 51 10.0	50 41.9	151.04	− 0.46	9.9952479	−41.2	8 29 20.88
14	318	231 51 35.8	51 7.5	151.10	0.35	9.9951498	40.4	8 25 24.97
15	319	232 52 3.0	51 34.5	151.16	0.22	9.9950538	39.6	8 21 29.05
16	320	233 52 31.7	52 3.1	151.23	− 0.09	9.9949598	−38.9	8 17 33.14
17	321	234 53 2.0	52 33.3	151.29	+ 0.04	9.9948679	38.0	8 13 37.23
18	322	235 53 33.9	53 5.1	151.36	0.16	9.9947780	37.1	8 9 41.32
19	323	236 54 7.5	53 38.5	151.43	+ 0.27	9.9946902	−36.2	8 5 45.41
20	324	237 54 42.7	54 13.5	151.50	0.36	9.9946045	35.3	8 1 49.50
21	325	238 55 19.6	54 50.2	151.57	0.42	9.9945207	34.5	7 57 53.59
22	326	239 55 58.1	55 28.6	151.64	+ 0.45	9.9944389	−33.7	7 53 57.68
23	327	240 56 38.3	56 8.6	151.71	0.45	9.9943590	32.9	7 50 1.76
24	328	241 57 20.2	56 50.3	151.78	0.43	9.9942809	32.2	7 46 5.85
25	329	242 58 3.8	57 33.7	151.85	+ 0.38	9.9942043	−31.6	7 42 9.94
26	330	243 58 49.0	58 18.7	151.92	0.30	9.9941292	31.0	7 38 14.03
27	331	244 59 35.7	59 5.2	151.98	0.20	9.9940555	30.4	7 34 18.12
28	332	245 60 23.8	59 53.2	152.04	+ 0.08	9.9939832	−29.9	7 30 22.21
29	333	247 1 13.4	0 42.6	152.10	− 0.05	9.9939122	29.3	7 26 26.30
30	334	248 2 4.3	1 33.3	152.15	0.18	9.9938425	28.8	7 22 30.39
31	335	249 2 56.4	2 25.2	152.20	− 0.31	9.9937740	−28.2	7 18 34.47

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January 0d.0.

Diff. for 1 Hour,
—9s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 53.9	14 56.5	54 33.9	+0.77	54 43.6	+0.85	δ		29.5
2	14 59.4	15 2.5	54 54.1	0.91	55 5.5	0.99	0 17.3	1.88	0.7
3	15 5.8	15 9.3	55 17.7	1.05	55 30.6	1.11	1 4.0	2.02	1.7
4	15 13.1	15 17.0	55 44.3	+1.17	55 58.7	+1.24	1 54.2	2.19	2.7
5	15 21.1	15 25.5	56 13.9	1.30	56 29.8	1.36	2 47.6	2.28	3.7
6	15 30.0	15 34.7	56 46.4	1.42	57 3.7	1.47	3 43.6	2.34	4.7
7	15 39.6	15 44.6	57 21.6	+1.52	57 40.2	+1.57	4 40.5	2.36	5.7
8	15 49.8	15 55.0	57 59.2	1.60	58 18.4	1.61	5 36.8	2.31	6.7
9	16 0.3	16 5.5	58 37.7	1.61	58 56.9	1.57	6 31.5	2.24	7.7
10	16 10.5	16 15.3	59 15.4	+1.50	59 32.9	+1.41	7 24.2	2.16	8.7
11	16 19.7	16 23.6	59 49.0	1.27	60 3.3	1.10	8 15.3	2.11	9.7
12	16 26.8	16 29.3	60 15.2	0.88	60 24.3	0.62	9 5.7	2.11	10.7
13	16 30.9	16 31.5	60 30.1	+0.34	60 32.5	+0.04	9 56.6	2.15	11.7
14	16 31.1	16 29.7	60 31.0	−0.29	60 25.7	−0.61	10 49.0	2.23	12.7
15	16 27.2	16 23.6	60 16.4	0.93	60 3.4	1.23	11 43.8	2.34	13.7
16	16 19.1	16 13.8	59 47.0	−1.50	59 27.5	−1.74	12 41.3	2.43	14.7
17	16 7.8	16 1.3	59 5.4	1.93	58 41.3	2.07	13 40.5	2.47	15.7
18	15 54.3	15 47.2	58 15.8	2.16	57 49.6	2.20	14 39.8	2.43	16.7
19	15 40.0	15 32.8	57 23.1	−2.20	56 56.9	−2.16	15 37.3	2.32	17.7
20	15 25.9	15 19.4	56 31.5	2.07	56 7.4	1.94	16 31.2	2.16	18.7
21	15 13.3	15 7.7	55 45.0	1.79	55 24.5	1.62	17 21.0	1.99	19.7
22	15 2.7	14 58.3	55 6.2	−1.44	54 50.2	−1.23	18 6.9	1.85	20.7
23	14 54.7	14 51.7	54 36.8	1.01	54 25.9	0.80	18 49.7	1.74	21.7
24	14 49.5	14 47.9	54 17.6	0.59	54 11.9	−0.37	19 30.3	1.67	22.7
25	14 47.1	14 46.9	54 8.8	−0.16	54 8.2	+0.05	20 9.8	1.65	23.7
26	14 47.4	14 48.4	54 9.9	+0.24	54 13.8	0.41	20 49.4	1.67	24.7
27	14 50.1	14 52.2	54 19.8	0.58	54 27.6	0.73	21 30.1	1.74	25.7
28	14 54.8	14 57.7	54 37.1	+0.85	54 48.0	+0.97	22 13.0	1.85	26.7
29	15 1.1	15 4.7	55 0.2	1.06	55 13.4	1.13	22 58.9	1.99	27.7
30	15 8.4	15 12.4	55 27.3	1.19	55 41.8	1.23	23 48.5	2.14	28.7
31	15 16.4	15 20.5	55 56.7	+1.25	56 11.7	+1.26	δ		0.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 16 20.13	1.8806	S.11 43 7.3	12.405
1	14 18 13.08	1.8843	11 55 30.4	12.364
2	14 20 6.25	1.8881	12 7 51.0	12.323
3	14 21 59.65	1.8919	12 20 9.1	12.281
4	14 23 53.28	1.8958	12 32 24.7	12.238
5	14 25 47.15	1.8998	12 44 37.6	12.193
6	14 27 41.26	1.9038	12 56 47.8	12.148
7	14 29 35.61	1.9078	13 8 55.3	12.102
8	14 31 30.20	1.9119	13 21 0.0	12.054
9	14 33 25.04	1.9161	13 33 1.8	12.006
10	14 35 20.13	1.9203	13 45 0.7	11.957
11	14 37 15.48	1.9246	13 56 56.6	11.907
12	14 39 11.08	1.9289	14 8 49.5	11.856
13	14 41 6.94	1.9332	14 20 39.3	11.804
14	14 43 3.06	1.9376	14 32 26.0	11.751
15	14 44 59.45	1.9421	14 44 9.4	11.696
16	14 46 56.11	1.9466	14 55 49.5	11.641
17	14 48 53.04	1.9511	15 7 26.3	11.586
18	14 50 50.24	1.9557	15 18 59.8	11.529
19	14 52 47.72	1.9603	15 30 29.8	11.471
20	14 54 45.48	1.9649	15 41 56.3	11.411
21	14 56 43.51	1.9696	15 53 19.1	11.350
22	14 58 41.83	1.9744	16 4 38.3	11.289
23	15 0 40.44	1.9792	S.16 15 53.8	11.227

MONDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 2 39.34	1.9841	S.16 27 5.5	11.163
1	15 4 38.53	1.9889	16 38 13.3	11.099
2	15 6 38.01	1.9938	16 49 17.3	11.034
3	15 8 37.79	1.9987	17 0 17.4	10.968
4	15 10 37.86	2.0037	17 11 13.5	10.900
5	15 12 38.24	2.0088	17 22 5.4	10.830
6	15 14 38.92	2.0138	17 32 53.1	10.760
7	15 16 39.90	2.0189	17 43 36.6	10.690
8	15 18 41.19	2.0241	17 54 15.9	10.618
9	15 20 42.79	2.0292	18 4 50.8	10.545
10	15 22 44.70	2.0344	18 15 21.3	10.471
11	15 24 46.92	2.0397	18 25 47.3	10.396
12	15 26 49.46	2.0449	18 36 8.8	10.320
13	15 28 52.31	2.0502	18 46 25.7	10.242
14	15 30 55.48	2.0555	18 56 37.9	10.163
15	15 32 58.97	2.0608	19 6 45.3	10.083
16	15 35 2.78	2.0662	19 16 47.9	10.002
17	15 37 6.91	2.0715	19 26 45.6	9.921
18	15 39 11.36	2.0769	19 36 38.4	9.838
19	15 41 16.14	2.0823	19 46 26.2	9.754
20	15 43 21.24	2.0877	19 56 8.9	9.668
21	15 45 26.67	2.0932	20 5 46.4	9.582
22	15 47 32.43	2.0987	20 15 18.7	9.494
23	15 49 38.52	2.1042	20 24 45.7	9.406
24	15 51 44.93	2.1096	S.20 34 7.4	9.317

TUESDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	15 51 44.93	2.1096	S.20 34 7.4	9.317
1	15 53 51.67	2.1151	20 43 23.7	9.226
2	15 55 58.75	2.1207	20 52 34.5	9.133
3	15 58 6.16	2.1262	21 1 39.7	9.040
4	16 0 13.90	2.1317	21 10 39.3	8.946
5	16 2 21.97	2.1373	21 19 33.2	8.850
6	16 4 30.38	2.1429	21 28 21.3	8.753
7	16 6 39.12	2.1484	21 37 3.6	8.656
8	16 8 48.19	2.1539	21 45 40.0	8.557
9	16 10 57.59	2.1595	21 54 10.5	8.457
10	16 13 7.33	2.1651	22 2 34.9	8.356
11	16 15 17.40	2.1706	22 10 53.2	8.254
12	16 17 27.80	2.1761	22 19 5.4	8.151
13	16 19 38.53	2.1817	22 27 11.3	8.046
14	16 21 49.60	2.1872	22 35 10.9	7.941
15	16 24 1.00	2.1927	22 43 4.2	7.834
16	16 26 12.73	2.1982	22 50 51.0	7.726
17	16 28 24.79	2.2037	22 58 31.3	7.617
18	16 30 37.17	2.2091	23 6 5.1	7.507
19	16 32 49.88	2.2146	23 13 32.2	7.396
20	16 35 2.92	2.2201	23 20 52.6	7.284
21	16 37 16.29	2.2255	23 28 6.3	7.171
22	16 39 29.98	2.2308	23 35 13.1	7.056
23	16 41 43.99	2.2362	S.23 42 13.0	6.941

WEDNESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	16 43 58.33	2.2416	S.23 49 6.0	6.824
1	16 46 12.99	2.2469	23 55 51.9	6.706
2	16 48 27.96	2.2521	24 2 30.7	6.587
3	16 50 43.24	2.2573	24 9 2.4	6.468
4	16 52 58.84	2.2626	24 15 26.9	6.347
5	16 55 14.75	2.2679	24 21 44.1	6.225
6	16 57 30.98	2.2731	24 27 53.9	6.102
7	16 59 47.52	2.2781	24 33 56.3	5.978
8	17 2 4.35	2.2830	24 39 51.3	5.853
9	17 4 21.48	2.2880	24 45 38.7	5.727
10	17 6 38.91	2.2930	24 51 18.5	5.600
11	17 8 56.64	2.2979	24 56 50.7	5.472
12	17 11 14.66	2.3027	25 2 15.2	5.343
13	17 13 32.97	2.3076	25 7 31.9	5.213
14	17 15 51.57	2.3124	25 12 40.8	5.082
15	17 18 10.46	2.3172	25 17 41.8	4.950
16	17 20 29.63	2.3218	25 22 34.8	4.817
17	17 22 49.07	2.3264	25 27 19.8	4.683
18	17 25 8.79	2.3309	25 31 56.8	4.549
19	17 27 28.78	2.3353	25 36 25.7	4.413
20	17 29 49.03	2.3398	25 40 46.4	4.277
21	17 32 9.55	2.3442	25 44 58.9	4.139
22	17 34 30.33	2.3484	25 49 3.1	4.001
23	17 36 51.36	2.3525	25 52 59.0	3.862
24	17 39 12.63	2.3566	S.25 56 46.5	3.722

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					SATURDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 39 12.63	2.3566	S.25 56 46.5	3.723	0	19 35 24.33	2.4471	S.26 2 27.4	3.625
1	17 41 34.15	2.3607	26 0 25.6	3.581	1	19 37 51.14	2.4466	25 58 45.2	3.783
2	17 43 55.92	2.3647	26 3 56.2	3.439	2	19 40 17.92	2.4460	25 54 53.5	3.940
3	17 46 17.92	2.3686	26 7 18.3	3.297	3	19 42 44.66	2.4452	25 50 52.4	4.097
4	17 48 40.15	2.3724	26 10 31.8	3.154	4	19 45 11.35	2.4444	25 46 41.9	4.253
5	17 51 2.61	2.3762	26 13 36.7	3.010	5	19 47 37.99	2.4435	25 42 22.0	4.409
6	17 53 25.29	2.3798	26 16 33.0	2.866	6	19 50 4.57	2.4424	25 37 52.8	4.565
7	17 55 48.19	2.3834	26 19 20.6	2.720	7	19 52 31.08	2.4413	25 33 14.2	4.722
8	17 58 11.30	2.3868	26 21 59.4	2.574	8	19 54 57.53	2.4402	25 28 26.2	4.878
9	18 0 34.61	2.3902	26 24 29.4	2.427	9	19 57 23.91	2.4390	25 23 28.9	5.033
10	18 2 58.12	2.3936	26 26 50.6	2.279	10	19 59 50.21	2.4376	25 18 22.3	5.188
11	18 5 21.84	2.3969	26 29 2.9	2.131	11	20 2 16.42	2.4361	25 13 6.4	5.343
12	18 7 45.75	2.4000	26 31 6.3	1.982	12	20 4 42.54	2.4346	25 7 41.2	5.497
13	18 10 9.84	2.4030	26 33 0.8	1.833	13	20 7 8.57	2.4330	25 2 6.8	5.650
14	18 12 34.11	2.4060	26 34 46.3	1.683	14	20 9 34.50	2.4313	24 56 23.2	5.803
15	18 14 58.56	2.4089	26 36 22.7	1.532	15	20 12 0.33	2.4296	24 50 30.5	5.955
16	18 17 23.18	2.4117	26 37 50.1	1.381	16	20 14 26.05	2.4277	24 44 28.6	6.107
17	18 19 47.96	2.4143	26 39 8.4	1.229	17	20 16 51.66	2.4258	24 38 17.6	6.259
18	18 22 12.89	2.4169	26 40 17.6	1.077	18	20 19 17.15	2.4238	24 31 57.5	6.410
19	18 24 37.98	2.4194	26 41 17.6	0.924	19	20 21 42.52	2.4217	24 25 28.4	6.560
20	18 27 3.22	2.4217	26 42 8.4	0.771	20	20 24 7.76	2.4197	24 18 50.3	6.711
21	18 29 28.59	2.4239	26 42 50.1	0.617	21	20 26 32.88	2.4176	24 12 3.1	6.861
22	18 31 54.09	2.4261	26 43 22.5	0.463	22	20 28 57.87	2.4153	24 5 7.0	7.009
23	18 34 19.73	2.4283	S.26 43 45.7	0.309	23	20 31 22.72	2.4130	S.23 58 2.0	7.157
	FRIDAY 6.					SUNDAY 8.			
0	18 36 45.49	2.4302	S.26 43 59.6	− 0.154	0	20 33 47.43	2.4107	S.23 50 48.1	7.305
1	18 39 11.36	2.4321	26 44 4.2	+ 0.002	1	20 36 12.00	2.4082	23 43 25.4	7.452
2	18 41 37.34	2.4339	26 43 59.4	0.157	2	20 38 36.42	2.4057	23 35 53.9	7.598
3	18 44 3.43	2.4357	26 43 45.3	0.313	3	20 41 0.69	2.4032	23 28 13.6	7.744
4	18 46 29.62	2.4372	26 43 21.8	0.470	4	20 43 24.81	2.4007	23 20 24.6	7.888
5	18 48 55.90	2.4387	26 42 48.9	0.626	5	20 45 48.77	2.3980	23 12 27.0	8.031
6	18 51 22.26	2.4400	26 42 6.7	0.782	6	20 48 12.57	2.3953	23 4 20.9	8.174
7	18 53 48.70	2.4413	26 41 15.1	0.939	7	20 50 36.21	2.3926	22 56 6.2	8.317
8	18 56 15.22	2.4425	26 40 14.0	1.097	8	20 52 59.68	2.3898	22 47 42.9	8.459
9	18 58 41.80	2.4435	26 39 3.4	1.255	9	20 55 22.99	2.3871	22 39 11.1	8.600
10	19 1 8.44	2.4445	26 37 43.4	1.413	10	20 57 46.13	2.3843	22 30 30.9	8.740
11	19 3 35.14	2.4453	26 36 13.9	1.571	11	21 0 9.10	2.3813	22 21 42.3	8.878
12	19 6 1.88	2.4460	26 34 34.9	1.729	12	21 2 31.89	2.3783	22 12 45.5	9.016
13	19 8 28.66	2.4467	26 32 46.4	1.887	13	21 4 54.50	2.3754	22 3 40.4	9.154
14	19 10 55.48	2.4473	26 30 48.5	2.044	14	21 7 16.94	2.3725	21 54 27.0	9.291
15	19 13 22.34	2.4478	26 28 41.1	2.202	15	21 9 39.20	2.3695	21 45 5.5	9.426
16	19 15 49.22	2.4481	26 26 24.2	2.361	16	21 12 1.28	2.3664	21 35 35.9	9.560
17	19 18 16.11	2.4483	26 23 57.8	2.519	17	21 14 23.17	2.3633	21 25 58.3	9.693
18	19 20 43.01	2.4484	26 21 21.9	2.678	18	21 16 44.88	2.3602	21 16 12.7	9.826
19	19 23 9.92	2.4485	26 18 36.5	2.836	19	21 19 6.40	2.3572	21 6 19.2	9.958
20	19 25 36.83	2.4484	26 15 41.6	2.993	20	21 21 27.74	2.3541	20 56 17.8	10.089
21	19 28 3.73	2.4482	26 12 37.3	3.151	21	21 23 48.89	2.3509	20 46 8.5	10.219
22	19 30 30.62	2.4480	26 9 23.5	3.309	22	21 26 9.85	2.3478	20 35 51.5	10.348
23	19 32 57.49	2.4476	26 6 0.2	3.467	23	21 28 30.62	2.3447	20 25 26.8	10.476
24	19 35 24.33	2.4471	S.26 2 27.4	3.625	24	21 30 51.21	2.3415	S.20 14 54.4	10.603

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	21 30 51.21	2.3415	S. 20 14 54.4	10.603
1	21 33 11.60	2.3383	20 4 14.5	10.728
2	21 35 31.80	2.3351	19 53 27.1	10.853
3	21 37 51.81	2.3319	19 42 32.2	10.977
4	21 40 11.63	2.3287	19 31 29.9	11.099
5	21 42 31.25	2.3254	19 20 20.3	11.220
6	21 44 50.68	2.3222	19 9 3.5	11.340
7	21 47 9.92	2.3191	18 57 39.5	11.459
8	21 49 28.97	2.3159	18 46 8.4	11.577
9	21 51 47.83	2.3128	18 34 30.2	11.695
10	21 54 6.50	2.3096	18 22 45.0	11.811
11	21 56 24.98	2.3064	18 10 52.9	11.925
12	21 58 43.26	2.3032	17 58 54.0	12.038
13	22 1 1.36	2.3001	17 46 48.3	12.151
14	22 3 19.27	2.2970	17 34 35.9	12.262
15	22 5 37.00	2.2939	17 22 16.8	12.372
16	22 7 54.54	2.2908	17 9 51.2	12.481
17	22 10 11.90	2.2877	16 57 19.1	12.588
18	22 12 29.07	2.2847	16 44 40.6	12.695
19	22 14 46.06	2.2817	16 31 55.7	12.800
20	22 17 2.87	2.2787	16 19 4.6	12.903
21	22 19 19.51	2.2758	16 6 7.3	13.006
22	22 21 35.97	2.2729	15 53 3.9	13.107
23	22 23 52.26	2.2700	S. 15 39 54.4	13.207

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	22 26 8.37	2.2671	S. 15 26 39.0	13.306
1	22 28 24.31	2.2643	15 13 17.7	13.403
2	22 30 40.08	2.2615	14 59 50.6	13.500
3	22 32 55.69	2.2587	14 46 17.7	13.596
4	22 35 11.13	2.2560	14 32 39.1	13.689
5	22 37 26.41	2.2534	14 18 55.0	13.781
6	22 39 41.54	2.2508	14 5 5.4	13.872
7	22 41 56.51	2.2482	13 51 10.4	13.962
8	22 44 11.32	2.2456	13 37 10.0	14.050
9	22 46 25.98	2.2431	13 23 4.4	14.136
10	22 48 40.49	2.2407	13 8 53.7	14.222
11	22 50 54.86	2.2383	12 54 37.8	14.307
12	22 53 9.09	2.2360	12 40 16.9	14.389
13	22 55 23.18	2.2337	12 25 51.1	14.471
14	22 57 37.13	2.2314	12 11 20.4	14.551
15	22 59 50.94	2.2292	11 56 45.0	14.629
16	23 2 4.63	2.2271	11 42 4.9	14.707
17	23 4 18.19	2.2249	11 27 20.2	14.782
18	23 6 31.62	2.2228	11 12 31.0	14.857
19	23 8 44.93	2.2209	10 57 37.4	14.930
20	23 10 58.13	2.2190	10 42 39.4	15.002
21	23 13 11.21	2.2171	10 27 37.2	15.073
22	23 15 24.18	2.2153	10 12 30.8	15.141
23	23 17 37.05	2.2136	9 57 20.3	15.207
24	23 19 49.81	2.2119	S. 9 42 5.9	15.272

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 19 49.81	2.2119	S. 9 42 5.9	15.272
1	23 22 2.47	2.2102	9 26 47.6	15.337
2	23 24 15.04	2.2087	9 11 25.4	15.401
3	23 26 27.52	2.2072	8 55 59.5	15.462
4	23 28 39.91	2.2058	8 40 30.0	15.522
5	23 30 52.22	2.2044	8 24 56.9	15.580
6	23 33 4.44	2.2031	8 9 20.4	15.637
7	23 35 16.59	2.2019	7 53 40.5	15.692
8	23 37 28.67	2.2007	7 37 57.3	15.746
9	23 39 40.67	2.1995	7 22 11.0	15.797
10	23 41 52.61	2.1986	7 6 21.6	15.848
11	23 44 4.50	2.1977	6 50 29.2	15.897
12	23 46 16.33	2.1968	6 34 33.9	15.945
13	23 48 28.11	2.1959	6 18 35.8	15.991
14	23 50 39.84	2.1952	6 2 35.0	16.036
15	23 52 51.53	2.1945	5 46 31.5	16.079
16	23 55 3.18	2.1938	5 30 25.5	16.120
17	23 57 14.79	2.1932	5 14 17.1	16.159
18	23 59 26.37	2.1928	4 58 6.4	16.197
19	0 1 37.93	2.1925	4 41 53.4	16.234
20	0 3 49.47	2.1922	4 25 38.3	16.269
21	0 6 0.99	2.1919	4 9 21.1	16.302
22	0 8 12.50	2.1917	3 53 2.0	16.333
23	0 10 24.00	2.1916	S. 3 36 41.1	16.363

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 12 35.49	2.1916	S. 3 20 18.4	16.392
1	0 14 46.99	2.1917	3 3 54.1	16.418
2	0 16 58.49	2.1918	2 47 28.2	16.444
3	0 19 10.00	2.1920	2 31 0.8	16.467
4	0 21 21.53	2.1923	2 14 32.1	16.489
5	0 23 33.08	2.1926	1 58 2.1	16.509
6	0 25 44.64	2.1929	1 41 31.0	16.527
7	0 27 56.23	2.1935	1 24 58.9	16.543
8	0 30 7.86	2.1941	1 8 25.8	16.559
9	0 32 19.52	2.1947	0 51 51.8	16.572
10	0 34 31.22	2.1954	0 35 17.1	16.583
11	0 36 42.97	2.1963	0 18 41.8	16.593
12	0 38 54.78	2.1972	S. 0 2 5.9	16.602
13	0 41 6.64	2.1981	N. 0 14 30.4	16.608
14	0 43 18.55	2.1991	0 31 7.0	16.613
15	0 45 30.53	2.2002	0 47 43.9	16.616
16	0 47 42.58	2.2014	1 4 20.9	16.617
17	0 49 54.70	2.2026	1 20 57.9	16.616
18	0 52 6.89	2.2039	1 37 34.8	16.613
19	0 54 19.17	2.2054	1 54 11.5	16.609
20	0 56 31.54	2.2068	2 10 47.9	16.603
21	0 58 43.99	2.2083	2 27 23.9	16.596
22	1 0 56.54	2.2100	2 43 59.4	16.587
23	1 3 9.19	2.2117	3 0 34.3	16.575
24	1 5 21.95	2.2135	N. 3 17 8.4	16.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 5 21.95	2.2136	N. 3 17 8.4	16.562
1	1 7 34.81	2.2153	3 33 41.7	16.547
2	1 9 47.79	2.2172	3 50 14.0	16.530
3	1 12 0.88	2.2192	4 6 45.3	16.512
4	1 14 14.09	2.2212	4 23 15.4	16.491
5	1 16 27.43	2.2233	4 39 44.2	16.469
6	1 18 40.89	2.2255	4 56 11.7	16.446
7	1 20 54.49	2.2278	5 12 37.7	16.419
8	1 23 8.23	2.2301	5 29 2.0	16.391
9	1 25 22.10	2.2324	5 45 24.6	16.362
10	1 27 36.12	2.2349	6 1 45.4	16.331
11	1 29 50.29	2.2375	6 18 4.3	16.297
12	1 32 4.62	2.2401	6 34 21.1	16.262
13	1 34 19.10	2.2427	6 50 35.8	16.226
14	1 36 33.74	2.2454	7 6 48.2	16.187
15	1 38 48.55	2.2482	7 22 58.2	16.146
16	1 41 3.53	2.2511	7 39 5.7	16.103
17	1 43 18.68	2.2540	7 55 10.6	16.059
18	1 45 34.01	2.2570	8 11 12.8	16.013
19	1 47 49.52	2.2600	8 27 12.2	15.965
20	1 50 5.21	2.2631	8 43 8.6	15.915
21	1 52 21.09	2.2662	8 59 2.0	15.863
22	1 54 37.16	2.2694	9 14 52.2	15.809
23	1 56 53.42	2.2727	N. 9 30 39.1	15.754

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 59 9.88	2.2760	N. 9 46 22.7	15.697
1	2 1 26.54	2.2793	10 2 2.8	15.637
2	2 3 43.40	2.2827	10 17 39.2	15.576
3	2 6 0.47	2.2862	10 33 11.9	15.513
4	2 8 17.75	2.2897	10 48 40.8	15.448
5	2 10 35.24	2.2932	11 4 5.7	15.381
6	2 12 52.94	2.2968	11 19 26.5	15.312
7	2 15 10.86	2.3005	11 34 43.1	15.242
8	2 17 29.00	2.3042	11 49 55.5	15.170
9	2 19 47.37	2.3080	12 5 3.5	15.096
10	2 22 5.96	2.3118	12 20 7.0	15.020
11	2 24 24.78	2.3156	12 35 5.9	14.942
12	2 26 43.83	2.3194	12 50 0.0	14.862
13	2 29 3.11	2.3233	13 4 49.3	14.780
14	2 31 22.63	2.3272	13 19 33.6	14.697
15	2 33 42.38	2.3312	13 34 12.9	14.612
16	2 36 2.37	2.3352	13 48 47.0	14.524
17	2 38 22.60	2.3391	14 3 15.8	14.435
18	2 40 43.06	2.3431	14 17 39.2	14.344
19	2 43 3.77	2.3472	14 31 57.1	14.252
20	2 45 24.73	2.3513	14 46 9.4	14.157
21	2 47 45.93	2.3554	15 0 16.0	14.061
22	2 50 7.38	2.3595	15 14 16.7	13.962
23	2 52 29.07	2.3636	15 28 11.5	13.863
24	2 54 51.01	2.3677	N.15 42 0.3	13.762

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 54 51.01	2.3677	N.15 42 0.3	13.762
1	2 57 13.20	2.3719	15 55 42.9	13.658
2	2 59 35.64	2.3761	16 9 19.3	13.554
3	3 1 58.33	2.3803	16 22 49.4	13.447
4	3 4 21.27	2.3845	16 36 13.0	13.338
5	3 6 44.47	2.3887	16 49 30.0	13.228
6	3 9 7.91	2.3928	17 2 40.4	13.117
7	3 11 31.60	2.3970	17 15 44.0	13.003
8	3 13 55.55	2.4012	17 28 40.7	12.888
9	3 16 19.75	2.4054	17 41 30.5	12.771
10	3 18 44.20	2.4096	17 54 13.2	12.652
11	3 21 8.90	2.4137	18 6 48.7	12.532
12	3 23 33.84	2.4178	18 19 17.0	12.410
13	3 25 59.03	2.4219	18 31 37.9	12.287
14	3 28 24.47	2.4261	18 43 51.4	12.162
15	3 30 50.16	2.4302	18 55 57.3	12.035
16	3 33 16.09	2.4342	19 7 55.6	11.907
17	3 35 42.26	2.4382	19 19 46.1	11.777
18	3 38 8.67	2.4422	19 31 28.8	11.646
19	3 40 35.32	2.4462	19 43 3.6	11.513
20	3 43 2.21	2.4501	19 54 30.4	11.379
21	3 45 29.33	2.4540	20 5 49.1	11.243
22	3 47 56.69	2.4578	20 16 59.6	11.107
23	3 50 24.27	2.4616	N.20 28 1.9	10.968

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 52 52.08	2.4653	N.20 38 55.8	10.828
1	3 55 20.11	2.4691	20 49 41.2	10.687
2	3 57 48.37	2.4728	21 0 18.2	10.545
3	4 0 16.85	2.4764	21 10 46.6	10.401
4	4 2 45.54	2.4799	21 21 6.3	10.256
5	4 5 14.44	2.4835	21 31 17.3	10.109
6	4 7 43.56	2.4870	21 41 19.4	9.961
7	4 10 12.88	2.4903	21 51 12.6	9.812
8	4 12 42.39	2.4935	22 0 56.9	9.662
9	4 15 12.10	2.4968	22 10 32.1	9.511
10	4 17 42.01	2.5000	22 19 58.2	9.358
11	4 20 12.10	2.5030	22 29 15.1	9.205
12	4 22 42.37	2.5060	22 38 22.8	9.051
13	4 25 12.82	2.5089	22 47 21.2	8.895
14	4 27 43.44	2.5118	22 56 10.2	8.737
15	4 30 14.24	2.5147	23 4 49.7	8.579
16	4 32 45.20	2.5173	23 13 19.7	8.421
17	4 35 16.32	2.5199	23 21 40.2	8.263
18	4 37 47.59	2.5224	23 29 51.2	8.103
19	4 40 19.01	2.5248	23 37 52.5	7.941
20	4 42 50.57	2.5271	23 45 44.1	7.778
21	4 45 22.26	2.5292	23 53 25.8	7.614
22	4 47 54.08	2.5313	24 0 57.7	7.450
23	4 50 26.02	2.5334	24 8 19.8	7.285
24	4 52 58.09	2.5354	N.24 15 32.1	7.122

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 52 58.09	2.5354	N.24 15 32.1	7.122
1	4 55 30.27	2.5372	24 22 34.4	6.955
2	4 58 2.55	2.5388	24 29 26.7	6.788
3	5 0 34.92	2.5403	24 36 8.9	6.620
4	5 3 7.38	2.5418	24 42 41.1	6.453
5	5 5 39.93	2.5432	24 49 3.3	6.285
6	5 8 12.56	2.5444	24 55 15.3	6.115
7	5 10 45.26	2.5455	25 1 17.1	5.946
8	5 13 18.02	2.5465	25 7 8.8	5.776
9	5 15 50.84	2.5474	25 12 50.3	5.606
10	5 18 23.71	2.5482	25 18 21.5	5.435
11	5 20 56.62	2.5488	25 23 42.5	5.265
12	5 23 29.56	2.5493	25 28 53.3	5.094
13	5 26 2.53	2.5497	25 33 53.8	4.922
14	5 28 35.52	2.5499	25 38 43.9	4.749
15	5 31 8.52	2.5500	25 43 23.7	4.577
16	5 33 41.52	2.5500	25 47 53.2	4.405
17	5 36 14.52	2.5499	25 52 12.3	4.232
18	5 38 47.51	2.5497	25 56 21.1	4.060
19	5 41 20.48	2.5493	26 0 19.5	3.888
20	5 43 53.42	2.5487	26 4 7.6	3.716
21	5 46 26.32	2.5480	26 7 45.4	3.543
22	5 48 59.18	2.5472	26 11 12.8	3.370
23	5 51 31.99	2.5462	N.26 14 29.8	3.197

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	5 54 4.73	2.5452	N.26 17 36.5	3.025
1	5 56 37.41	2.5441	26 20 32.8	2.853
2	5 59 10.02	2.5428	26 23 18.8	2.681
3	6 1 42.54	2.5413	26 25 54.5	2.508
4	6 4 14.97	2.5397	26 28 19.8	2.337
5	6 6 47.30	2.5379	26 30 34.9	2.166
6	6 9 19.52	2.5360	26 32 39.7	1.994
7	6 11 51.62	2.5341	26 34 34.2	1.823
8	6 14 23.61	2.5321	26 36 18.5	1.653
9	6 16 55.47	2.5298	26 37 52.6	1.483
10	6 19 27.19	2.5274	26 39 16.5	1.314
11	6 21 58.76	2.5249	26 40 30.3	1.145
12	6 24 30.18	2.5222	26 41 33.9	0.976
13	6 27 1.43	2.5194	26 42 27.4	0.807
14	6 29 32.51	2.5166	26 43 10.8	0.640
15	6 32 3.42	2.5137	26 43 44.2	0.473
16	6 34 34.15	2.5106	26 44 7.6	0.307
17	6 37 4.69	2.5073	26 44 21.0	+ 0.141
18	6 39 35.03	2.5039	26 44 24.5	− 0.024
19	6 42 5.16	2.5004	26 44 18.1	0.189
20	6 44 35.08	2.4968	26 44 1.8	0.353
21	6 47 4.78	2.4931	26 43 35.7	0.516
22	6 49 34.25	2.4892	26 42 59.8	0.678
23	6 52 3.49	2.4853	26 42 14.3	0.839
24	6 54 32.49	2.4813	N.26 41 19.1	1.001

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	6 54 32.49	2.4813	N.26 41 19.1	1.001
1	6 57 1.25	2.4772	26 40 14.2	1.161
2	6 59 29.75	2.4728	26 38 59.8	1.319
3	7 1 57.99	2.4684	26 37 35.9	1.477
4	7 4 25.96	2.4640	26 36 2.5	1.635
5	7 6 53.67	2.4595	26 34 19.7	1.792
6	7 9 21.10	2.4548	26 32 27.5	1.947
7	7 11 48.25	2.4501	26 30 26.0	2.102
8	7 14 15.11	2.4452	26 28 15.3	2.255
9	7 16 41.67	2.4402	26 25 55.4	2.407
10	7 19 7.93	2.4352	26 23 26.4	2.559
11	7 21 33.89	2.4301	26 20 48.3	2.710
12	7 23 59.54	2.4249	26 18 1.2	2.860
13	7 26 24.88	2.4196	26 15 5.1	3.008
14	7 28 49.89	2.4142	26 12 0.2	3.155
15	7 31 14.58	2.4087	26 8 46.5	3.301
16	7 33 38.94	2.4032	26 5 24.1	3.447
17	7 36 2.97	2.3977	26 1 52.9	3.592
18	7 38 26.66	2.3920	25 58 13.1	3.734
19	7 40 50.01	2.3862	25 54 24.8	3.876
20	7 43 13.01	2.3804	25 50 28.0	4.017
21	7 45 35.66	2.3746	25 46 22.7	4.157
22	7 47 57.96	2.3687	25 42 9.1	4.296
23	7 50 19.90	2.3628	N.25 37 47.2	4.432

FRIDAY 20

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 52 41.49	2.3568	N.25 33 17.2	4.568
1	7 55 2.72	2.3507	25 28 39.0	4.704
2	7 57 23.57	2.3444	25 23 52.7	4.837
3	7 59 44.05	2.3382	25 18 58.5	4.969
4	8 2 4.16	2.3321	25 13 56.4	5.101
5	8 4 23.90	2.3259	25 8 46.4	5.232
6	8 6 43.27	2.3197	25 3 28.6	5.361
7	8 9 2.26	2.3133	24 58 3.1	5.488
8	8 11 20.86	2.3069	24 52 30.0	5.614
9	8 13 39.08	2.3005	24 46 49.4	5.739
10	8 15 56.92	2.2941	24 41 1.3	5.864
11	8 18 14.37	2.2877	24 35 5.7	5.987
12	8 20 31.44	2.2812	24 29 2.8	6.109
13	8 22 48.12	2.2747	24 22 52.6	6.229
14	8 25 4.41	2.2682	24 16 35.3	6.348
15	8 27 20.30	2.2616	24 10 10.9	6.466
16	8 29 35.80	2.2551	24 3 39.4	6.582
17	8 31 50.91	2.2485	23 57 1.0	6.697
18	8 34 5.62	2.2419	23 50 15.7	6.812
19	8 36 19.94	2.2354	23 43 23.5	6.926
20	8 38 33.87	2.2288	23 36 24.6	7.037
21	8 40 47.40	2.2223	23 29 19.1	7.147
22	8 43 0.54	2.2157	23 22 7.0	7.257
23	8 45 13.28	2.2090	23 14 48.3	7.365
24	8 47 25.62	2.2024	N.23 7 23.2	7.472

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	8 47 25.62	2.2024	N.23 7 23.2	7.472
1	8 49 37.57	2.1959	22 59 51.7	7.577
2	8 51 49.13	2.1893	22 52 13.9	7.682
3	8 54 0.29	2.1827	22 44 29.9	7.785
4	8 56 11.06	2.1762	22 36 39.7	7.887
5	8 58 21.44	2.1697	22 28 43.4	7.987
6	9 0 31.42	2.1631	22 20 41.2	8.087
7	9 2 41.01	2.1566	22 12 33.0	8.186
8	9 4 50.21	2.1502	22 4 18.9	8.282
9	9 6 59.03	2.1437	21 55 59.1	8.378
10	9 9 7.46	2.1372	21 47 33.5	8.474
11	9 11 15.50	2.1308	21 39 2.2	8.567
12	9 13 23.16	2.1245	21 30 25.4	8.659
13	9 15 30.44	2.1181	21 21 43.1	8.751
14	9 17 37.33	2.1117	21 12 55.3	8.842
15	9 19 43.84	2.1054	21 4 2.1	8.931
16	9 21 49.97	2.0991	20 55 3.6	9.018
17	9 23 55.73	2.0928	20 45 59.9	9.105
18	9 26 1.11	2.0866	20 36 51.0	9.191
19	9 28 6.12	2.0804	20 27 37.0	9.276
20	9 30 10.76	2.0743	20 18 17.9	9.359
21	9 32 15.04	2.0682	20 8 53.9	9.441
22	9 34 18.95	2.0622	19 59 25.0	9.522
23	9 36 22.50	2.0561	N.19 49 51.2	9.602

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	9 38 25.68	2.0501	N.19 40 12.7	9.681
1	9 40 28.51	2.0442	19 30 29.5	9.759
2	9 42 30.98	2.0383	19 20 41.6	9.837
3	9 44 33.10	2.0324	19 10 49.1	9.913
4	9 46 34.87	2.0266	19 0 52.1	9.988
5	9 48 36.30	2.0209	18 50 50.6	10.062
6	9 50 37.38	2.0152	18 40 44.7	10.134
7	9 52 38.12	2.0095	18 30 34.5	10.206
8	9 54 38.52	2.0039	18 20 20.0	10.277
9	9 56 38.59	1.9984	18 10 1.3	10.347
10	9 58 38.33	1.9929	17 59 38.4	10.415
11	10 0 37.74	1.9874	17 49 11.5	10.482
12	10 2 36.82	1.9820	17 38 40.6	10.549
13	10 4 35.58	1.9766	17 28 5.7	10.615
14	10 6 34.02	1.9713	17 17 26.8	10.680
15	10 8 32.14	1.9661	17 6 44.1	10.744
16	10 10 29.95	1.9610	16 55 57.6	10.807
17	10 12 27.46	1.9559	16 45 7.3	10.869
18	10 14 24.66	1.9508	16 34 13.3	10.930
19	10 16 21.56	1.9458	16 23 15.7	10.990
20	10 18 18.16	1.9408	16 12 14.5	11.049
21	10 20 14.46	1.9359	16 1 9.8	11.107
22	10 22 10.47	1.9311	15 50 1.6	11.165
23	10 24 6.19	1.9263	15 38 50.0	11.221
24	10 26 1.63	1.9216	N.15 27 35.1	11.276

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 26 1.63	1.9216	N.15 27 35.1	11.276
1	10 27 56.79	1.9170	15 16 16.9	11.331
2	10 29 51.67	1.9124	15 4 55.4	11.386
3	10 31 46.28	1.9079	14 53 30.6	11.439
4	10 33 40.62	1.9035	14 42 2.7	11.491
5	10 35 34.70	1.8992	14 30 31.7	11.542
6	10 37 28.52	1.8949	14 18 57.7	11.592
7	10 39 22.08	1.8906	14 7 20.7	11.642
8	10 41 15.39	1.8863	13 55 40.7	11.691
9	10 43 8.44	1.8822	13 43 57.8	11.739
10	10 45 1.25	1.8782	13 32 12.0	11.786
11	10 46 53.82	1.8742	13 20 23.5	11.832
12	10 48 46.15	1.8702	13 8 32.2	11.877
13	10 50 38.25	1.8664	12 56 38.2	11.922
14	10 52 30.12	1.8626	12 44 41.6	11.966
15	10 54 21.76	1.8588	12 32 42.3	12.010
16	10 56 13.18	1.8552	12 20 40.4	12.052
17	10 58 4.39	1.8516	12 8 36.0	12.093
18	10 59 55.38	1.8481	11 56 29.2	12.134
19	11 1 46.16	1.8447	11 44 19.9	12.175
20	11 3 36.74	1.8413	11 32 8.2	12.214
21	11 5 27.12	1.8381	11 19 54.2	12.252
22	11 7 17.31	1.8348	11 7 37.9	12.290
23	11 9 7.30	1.8316	N.10 55 19.4	12.327

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 10 57.10	1.8285	N.10 42 58.6	12.364
1	11 12 46.72	1.8255	10 30 35.7	12.399
2	11 14 36.16	1.8225	10 18 10.7	12.435
3	11 16 25.42	1.8196	10 5 43.5	12.470
4	11 18 14.51	1.8168	9 53 14.3	12.503
5	11 20 3.43	1.8140	9 40 43.2	12.536
6	11 21 52.19	1.8113	9 28 10.1	12.567
7	11 23 40.79	1.8087	9 15 35.1	12.599
8	11 25 29.24	1.8062	9 2 58.2	12.630
9	11 27 17.53	1.8037	8 50 19.5	12.660
10	11 29 5.68	1.8013	8 37 39.0	12.689
11	11 30 53.69	1.7990	8 24 56.8	12.718
12	11 32 41.56	1.7967	8 12 12.9	12.746
13	11 34 29.29	1.7945	7 59 27.3	12.773
14	11 36 16.90	1.7924	7 46 40.1	12.800
15	11 38 4.38	1.7903	7 33 51.3	12.826
16	11 39 51.74	1.7884	7 21 1.0	12.851
17	11 41 38.99	1.7865	7 8 9.2	12.876
18	11 43 26.12	1.7847	6 55 15.9	12.900
19	11 45 13.15	1.7829	6 42 21.2	12.923
20	11 47 0.07	1.7812	6 29 25.2	12.945
21	11 48 46.89	1.7795	6 16 27.8	12.967
22	11 50 33.61	1.7780	6 3 29.1	12.989
23	11 52 20.25	1.7766	5 50 29.1	13.010
24	11 54 6.80	1.7752	N. 5 37 27.9	13.030

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	11 54 6.80	1.7752	N. 5 37 27.9	13.030
1	11 55 53.27	1.7738	5 24 25.5	13.049
2	11 57 39.66	1.7725	5 11 22.0	13.068
3	11 59 25.97	1.7712	4 58 17.4	13.086
4	12 1 12.21	1.7702	4 45 11.7	13.104
5	12 2 58.39	1.7692	4 32 5.0	13.121
6	12 4 44.51	1.7682	4 18 57.2	13.137
7	12 6 30.57	1.7672	4 5 48.5	13.152
8	12 8 16.58	1.7664	3 52 38.9	13.167
9	12 10 2.54	1.7656	3 39 28.5	13.181
10	12 11 48.45	1.7649	3 26 17.2	13.195
11	12 13 34.33	1.7643	3 13 5.1	13.208
12	12 15 20.17	1.7637	2 59 52.3	13.220
13	12 17 5.98	1.7632	2 46 38.7	13.232
14	12 18 51.76	1.7628	2 33 24.5	13.243
15	12 20 37.52	1.7625	2 20 9.6	13.253
16	12 22 23.26	1.7622	2 6 54.1	13.263
17	12 24 8.99	1.7620	1 53 38.0	13.272
18	12 25 54.70	1.7618	1 40 21.4	13.281
19	12 27 40.40	1.7617	1 27 4.3	13.288
20	12 29 26.11	1.7619	1 13 46.8	13.296
21	12 31 11.83	1.7621	1 0 28.8	13.303
22	12 32 57.56	1.7022	0 47 10.4	13.309
23	12 34 43.29	1.7623	N. 0 33 51.7	13.314

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 36 29.03	1.7625	N. 0 20 32.8	13.318
1	12 38 14.79	1.7629	N. 0 7 13.6	13.322
2	12 40 0.58	1.7634	S. 0 6 5.8	13.326
3	12 41 46.40	1.7639	0 19 25.5	13.329
4	12 43 32.25	1.7645	0 32 45.3	13.330
5	12 45 18.14	1.7652	0 46 5.1	13.331
6	12 47 4.07	1.7659	0 59 25.0	13.332
7	12 48 50.05	1.7666	1 12 44.9	13.332
8	12 50 36.07	1.7674	1 26 4.8	13.332
9	12 52 22.14	1.7683	1 39 24.7	13.330
10	12 54 8.27	1.7694	1 52 44.4	13.328
11	12 55 54.47	1.7705	2 6 4.0	13.325
12	12 57 40.73	1.7716	2 19 23.4	13.322
13	12 59 27.06	1.7728	2 32 42.6	13.317
14	13 1 13.47	1.7741	2 46 1.5	13.312
15	13 2 59.96	1.7755	2 59 20.1	13.307
16	13 4 46.53	1.7768	3 12 38.3	13.301
17	13 6 33.18	1.7782	3 25 56.2	13.295
18	13 8 19.92	1.7798	3 39 13.7	13.287
19	13 10 6.76	1.7815	3 52 30.7	13.278
20	13 11 53.70	1.7832	4 5 47.1	13.269
21	13 13 40.74	1.7849	4 19 3.0	13.260
22	13 15 27.89	1.7868	4 32 18.3	13.249
23	13 17 15.16	1.7887	4 45 32.9	13.238
24	13 19 2.54	1.7907	S. 4 58 46.8	13.226

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	13 19 2.54	1.7907	S. 4 58 46.8	13.226
1	13 20 50.04	1.7927	5 12 0.0	13.213
2	13 22 37.67	1.7948	5 25 12.4	13.200
3	13 24 25.42	1.7970	5 38 24.0	13.186
4	13 26 13.31	1.7992	5 51 34.7	13.171
5	13 28 1.33	1.8015	6 4 44.5	13.155
6	13 29 49.49	1.8038	6 17 53.3	13.139
7	13 31 37.79	1.8063	6 31 1.1	13.122
8	13 33 26.25	1.8089	6 44 7.9	13.104
9	13 35 14.86	1.8115	6 57 13.6	13.085
10	13 37 3.63	1.8141	7 10 18.1	13.065
11	13 38 52.56	1.8168	7 23 21.4	13.045
12	13 40 41.65	1.8196	7 36 23.5	13.024
13	13 42 30.91	1.8225	7 49 24.3	13.002
14	13 44 20.35	1.8254	8 2 23.7	12.979
15	13 46 9.96	1.8283	8 15 21.8	12.956
16	13 47 59.75	1.8314	8 28 18.5	12.932
17	13 49 49.73	1.8345	8 41 13.6	12.906
18	13 51 39.89	1.8377	8 54 7.2	12.880
19	13 53 30.25	1.8410	9 6 59.2	12.853
20	13 55 20.81	1.8443	9 19 49.6	12.826
21	13 57 11.57	1.8477	9 32 38.3	12.797
22	13 59 2.53	1.8510	9 45 25.2	12.767
23	14 0 53.69	1.8544	S. 9 58 10.3	12.737

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	14 2 45.06	1.8580	S. 10 10 53.6	12.706
1	14 4 36.65	1.8617	10 23 35.0	12.674
2	14 6 28.46	1.8654	10 36 14.5	12.641
3	14 8 20.50	1.8692	10 48 51.9	12.606
4	14 10 12.76	1.8730	11 1 27.2	12.572
5	14 12 5.26	1.8769	11 14 0.5	12.537
6	14 13 57.99	1.8808	11 26 31.6	12.500
7	14 15 50.96	1.8848	11 39 0.5	12.462
8	14 17 44.17	1.8888	11 51 27.1	12.423
9	14 19 37.62	1.8929	12 3 51.3	12.383
10	14 21 31.32	1.8971	12 16 13.1	12.343
11	14 23 25.28	1.9014	12 28 32.5	12.302
12	14 25 19.49	1.9057	12 40 49.4	12.260
13	14 27 13.96	1.9100	12 53 3.7	12.217
14	14 29 8.69	1.9144	13 5 15.4	12.172
15	14 31 3.69	1.9189	13 17 24.4	12.127
16	14 32 58.96	1.9234	13 29 30.6	12.080
17	14 34 54.50	1.9280	13 41 34.0	12.033
18	14 36 50.32	1.9326	13 53 34.6	11.986
19	14 38 46.42	1.9373	14 5 32.3	11.936
20	14 40 42.80	1.9421	14 17 26.9	11.884
21	14 42 39.47	1.9469	14 29 18.4	11.833
22	14 44 36.43	1.9518	14 41 6.8	11.781
23	14 46 33.68	1.9567	14 52 52.1	11.728
24	14 48 31.23	1.9616	S. 15 4 34.2	11.674

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	14 48 31.23	1.9616	S.15 4 34.2	11.674
1	14 50 29.07	1.9666	15 16 13.0	11.618
2	14 52 27.22	1.9717	15 27 48.4	11.561
3	14 54 25.67	1.9768	15 39 20.3	11.503
4	14 56 24.43	1.9819	15 50 48.7	11.444
5	14 58 23.50	1.9871	16 2 13.6	11.384
6	15 0 22.88	1.9923	16 13 34.8	11.323
7	15 2 22.58	1.9976	16 24 52.3	11.261
8	15 4 22.60	2.0029	16 36 6.1	11.198
9	15 6 22.93	2.0083	16 47 16.1	11.134
10	15 8 23.59	2.0137	16 58 22.2	11.068
11	15 10 24.57	2.0191	17 9 24.3	11.001
12	15 12 25.88	2.0246	17 20 22.3	10.933
13	15 14 27.52	2.0302	17 31 16.2	10.864
14	15 16 29.50	2.0357	17 42 6.0	10.795
15	15 18 31.81	2.0413	17 52 51.6	10.794
16	15 20 34.46	2.0470	18 3 32.9	10.651
17	15 22 37.45	2.0526	18 14 9.7	10.576
18	15 24 40.78	2.0583	18 24 42.0	10.501
19	15 26 44.45	2.0641	18 35 9.8	10.426
20	15 28 48.47	2.0699	18 45 33.1	10.349
21	15 30 52.84	2.0757	18 55 51.7	10.270
22	15 32 57.56	2.0815	19 6 5.5	10.191
23	15 35 2.62	2.0873	S.19 16 14.6	10.111

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	15 37 8.03	2.0932	S.19 26 18.8	10.028
1	15 39 13.80	2.0991	19 36 18.0	9.945
2	15 41 19.92	2.1050	19 46 12.2	9.861
3	15 43 26.40	2.1109	19 56 1.3	9.775
4	15 45 33.23	2.1168	20 5 45.2	9.688
5	15 47 40.42	2.1228	20 15 23.8	9.600
6	15 49 47.97	2.1288	20 24 57.2	9.512
7	15 51 55.88	2.1348	20 34 25.2	9.421
8	15 54 4.15	2.1407	20 43 47.7	9.328
9	15 56 12.77	2.1467	20 53 4.6	9.235
10	15 58 21.76	2.1528	21 2 15.9	9.142
11	16 0 31.11	2.1588	21 11 21.6	9.047
12	16 2 40.82	2.1648	21 20 21.5	8.950
13	16 4 50.89	2.1709	21 29 15.6	8.852
14	16 7 1.33	2.1770	21 38 3.7	8.752
15	16 9 12.13	2.1830	21 46 45.8	8.652
16	16 11 23.29	2.1890	21 55 21.9	8.550
17	16 13 34.81	2.1950	22 3 51.8	8.447
18	16 15 46.69	2.2010	22 12 15.5	8.342
19	16 17 58.93	2.2070	22 20 32.9	8.237
20	16 20 11.53	2.2131	22 28 44.0	8.131
21	16 22 24.50	2.2191	22 36 48.6	8.023
22	16 24 37.82	2.2250	22 44 46.7	7.913
23	16 26 51.50	2.2309	22 52 38.2	7.803
24	16 29 5.53	2.2368	S.23 0 23.1	7.692

TUESDAY, DECEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 29 5.53	2.2368	S.23 0 23.1	7.692

PHASES OF THE MOON.

		d	h	m
● New Moon	Nov.	1	6	32.6
☽ First Quarter		8	20	46.4
○ Full Moon		15	12	16.1
☾ Last Quarter		22	20	25.9
● New Moon		30	23	45.0

		d	h
☾ Perigee	Nov.	13	13.2
☾ Apogee		25	8.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
2	Sun	W.	8° 8′ 56″	3348	9° 32′ 12″	3326	10° 55′ 53″	3308	12° 19′ 55″	3292
	α Aquilæ	E.	74 16 23	3816	73 1 37	3824	71 47 0	3833	70 32 32	3845
	Fomalhaut	E.	103 43 3	3093	102 14 45	3083	100 46 15	3074	99 17 34	3066
3	Sun	W.	19 24 10	3233	20 49 40	3223	22 15 22	3214	23 41 15	3204
	α Aquilæ	E.	64 23 37	3925	63 10 43	3948	61 58 12	3973	60 46 6	4002
	Fomalhaut	E.	91 51 35	3026	90 21 54	3018	88 52 3	3010	87 22 3	3002
	α Pegasi	E.	110 37 3	3312	109 13 5	3295	107 48 48	3280	106 24 13	3265
4	Sun	W.	30 53 30	3158	32 20 30	3148	33 47 42	3138	35 15 5	3129
	α Aquilæ	E.	54 53 28	4191	53 44 53	4241	52 37 6	4297	51 30 11	4358
	Fomalhaut	E.	79 49 48	2969	78 18 56	2962	76 47 56	2957	75 16 49	2950
	α Pegasi	E.	99 17 13	3201	97 51 5	3189	96 24 43	3178	94 58 8	3168
5	Sun	W.	42 34 55	3081	44 3 28	3070	45 32 14	3061	47 1 11	3051
	Antares	W.	17 9 38	2808	18 43 56	2788	20 18 40	2769	21 53 49	2751
	Fomalhaut	E.	67 39 30	2927	66 7 45	2922	64 35 54	2919	63 3 59	2915
	Jupiter	E.	72 46 43	2738	71 10 54	2727	69 34 53	2720	67 58 40	2712
	α Pegasi	E.	87 42 20	3124	86 14 40	3116	84 46 50	3109	83 18 51	3103
6	Sun	W.	54 29 9	2998	55 59 24	2987	57 29 53	2977	59 0 35	2965
	Antares	W.	29 54 48	2680	31 31 55	2668	33 9 18	2655	34 46 58	2643
	Fomalhaut	E.	55 23 37	2909	53 51 30	2910	52 19 24	2912	50 47 21	2916
	Jupiter	E.	59 54 39	2666	58 17 14	2657	56 39 37	2648	55 1 47	2639
	α Pegasi	E.	75 57 14	3078	74 28 38	3075	72 59 58	3073	71 31 15	3072
7	Sun	W.	66 37 37	2909	68 9 45	2897	69 42 8	2885	71 14 46	2873
	Antares	W.	42 59 22	2584	44 38 39	2572	46 18 13	2560	47 58 3	2548
	Fomalhaut	E.	43 8 49	2958	41 37 43	2973	40 6 57	2992	38 36 34	3015
	Jupiter	E.	46 49 25	2591	45 10 18	2581	43 30 57	2572	41 51 23	2561
	α Pegasi	E.	64 7 35	3078	62 38 58	3082	61 10 27	3089	59 42 4	3096
8	Sun	W.	79 1 52	2811	80 36 5	2798	82 10 35	2785	83 45 22	2773
	Antares	W.	56 21 18	2489	58 2 47	2477	59 44 33	2465	61 26 36	2453
	Jupiter	E.	33 30 17	2517	31 49 27	2509	30 8 26	2501	28 27 14	2493
	α Pegasi	E.	52 23 17	3168	50 56 29	3190	49 30 8	3216	48 4 18	3246
	α Arietis	E.	92 10 10	2569	90 30 33	2558	88 50 40	2546	87 10 31	2535
9	Sun	W.	91 43 26	2709	93 19 54	2696	94 56 39	2683	96 33 42	2670
	Antares	W.	70 1 9	2391	71 44 56	2380	73 29 0	2368	75 13 21	2355
	α Arietis	E.	78 45 49	2479	77 4 6	2469	75 22 9	2458	73 39 57	2448
	Aldebaran	E.	109 1 3	2415	107 17 49	2402	105 34 17	2389	103 50 27	2378
10	Sun	W.	104 43 12	2607	106 21 57	2595	108 0 59	2583	109 40 17	2571
	α Aquilæ	W.	46 28 47	4197	47 37 16	4077	48 47 40	3968	49 59 51	3868
	α Arietis	E.	65 5 28	2403	63 21 57	2394	61 38 14	2387	59 54 21	2381
	Aldebaran	E.	95 6 55	2317	93 21 20	2306	91 35 29	2294	89 49 21	2283
11	Sun	W.	118 0 51	2515	119 41 44	2504	121 22 52	2493	123 4 15	2484
	α Aquilæ	W.	56 23 55	3479	57 44 43	3419	59 6 38	3364	60 29 36	3312
	α Arietis	E.	51 12 53	2359	49 28 19	2358	47 43 44	2359	45 59 10	2361
	Aldebaran	E.	80 54 44	2232	79 7 4	2222	77 19 9	2213	75 31 1	2204

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
2	Sun	W.	13° 44′ 16″	3278	15° 8′ 53″	3265	16° 33′ 46″	3253	17° 58′ 52″	3243
	α Aquilæ	E.	69 18 16	3857	68 4 13	3871	66 50 24	3887	65 36 51	3906
	Fomalhaut	E.	97 48 43	3057	96 19 41	3049	94 50 29	3041	93 21 7	3033
3	Sun	W.	25 7 20	3194	26 33 36	3185	28 0 3	3176	29 26 41	3167
	α Aquilæ	E.	59 34 28	4038	58 23 20	4066	57 12 45	4103	56 2 46	4145
	Fomalhaut	E.	85 51 53	2996	84 21 35	2989	82 51 8	2981	81 20 32	2975
	α Pegasi	E.	104 59 20	3251	103 34 11	3238	102 8 47	3225	100 43 7	3213
4	Sun	W.	36 42 40	3119	38 10 26	3110	39 38 24	3100	41 6 34	3091
	α Aquilæ	E.	50 24 12	4427	49 19 15	4501	48 15 24	4585	47 12 46	4677
	Fomalhaut	E.	73 45 34	2945	72 14 12	2940	70 42 44	2936	69 11 10	2931
	α Pegasi	E.	93 31 21	3158	92 4 22	3149	90 37 12	3140	89 9 51	3132
5	Sun	W.	48 30 21	3040	49 59 44	3030	51 29 19	3020	52 59 7	3009
	Antares	W.	23 29 21	2735	25 5 14	2720	26 41 27	2706	28 17 59	2693
	Fomalhaut	E.	61 31 59	2912	59 59 56	2911	58 27 51	2909	56 55 44	2909
	Jupiter	E.	66 22 16	2703	64 45 40	2694	63 8 52	2685	61 31 52	2675
	α Pegasi	E.	81 50 45	3097	80 22 32	3091	78 54 12	3087	77 25 46	3082
6	Sun	W.	60 31 31	2954	62 2 41	2943	63 34 5	2931	65 5 44	2920
	Antares	W.	36 24 54	2631	38 3 7	2619	39 41 36	2607	41 20 21	2596
	Fomalhaut	E.	49 15 22	2920	47 43 29	2927	46 11 45	2935	44 40 11	2945
	Jupiter	E.	53 23 45	2629	51 45 30	2619	50 7 1	2610	48 28 19	2601
	α Pegasi	E.	70 2 31	3071	68 33 46	3070	67 5 0	3072	65 36 16	3074
7	Sun	W.	72 47 40	2861	74 20 49	2848	75 54 14	2836	77 27 55	2824
	Antares	W.	49 38 9	2537	51 18 31	2525	52 59 10	2512	54 40 6	2501
	Fomalhaut	E.	37 6 40	3043	35 37 20	3076	34 8 41	3116	32 40 51	3164
	Jupiter	E.	40 11 35	2552	38 31 34	2543	36 51 21	2534	35 10 55	2525
	α Pegasi	E.	58 13 50	3106	56 45 48	3118	55 18 0	3132	53 50 29	3148
8	Sun	W.	85 20 25	2760	86 55 45	2747	88 31 22	2735	90 7 16	2723
	Antares	W.	63 8 56	2441	64 51 33	2428	66 34 28	2416	68 17 40	2404
	Jupiter	E.	26 45 51	2487	25 4 20	2482	23 22 42	2480	21 41 1	2480
	α Pegasi	E.	46 39 3	3281	45 14 29	3322	43 50 43	3369	42 27 51	3423
	α Arietis	E.	85 30 6	2523	83 49 25	2512	82 8 29	2501	80 27 17	2489
9	Sun	W.	98 11 2	2657	99 48 39	2645	101 26 33	2632	103 4 44	2620
	Antares	W.	76 58 0	2344	78 42 56	2331	80 28 10	2320	82 13 40	2308
	α Arietis	E.	71 57 30	2438	70 14 49	2429	68 31 55	2419	66 48 48	2410
	Aldebaran	E.	102 6 20	2365	100 21 55	2353	98 37 12	2341	96 52 12	2329
10	Sun	W.	111 19 52	2559	112 59 43	2548	114 39 50	2536	116 20 13	2525
	α Aquilæ	W.	51 13 43	3777	52 29 9	3693	53 46 3	3616	55 4 20	3545
	α Arietis	E.	58 10 19	2375	56 26 8	2369	54 41 49	2364	52 57 23	2362
	Aldebaran	E.	88 2 57	2272	86 16 17	2262	84 29 21	2251	82 42 10	2241
11	Sun	W.	124 45 51	2474	126 27 41	2465	128 9 43	2457	129 51 57	2448
	α Aquilæ	W.	61 53 34	3265	63 18 27	3221	64 44 11	3181	66 10 43	3144
	α Arietis	E.	44 14 39	2364	42 30 13	2371	40 45 56	2379	39 1 51	2389
	Aldebaran	E.	73 42 40	2196	71 54 7	2188	70 5 21	2181	68 16 25	2174

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L of Diff.	IXh.	P. L. of Diff.
12	α Aquilæ	W.	67° 37′ 59″	3111	69° 5′ 55″	3080	70° 34′ 29″	3052	72° 3′ 37″	3026
	Fomalhaut	W.	32 58 39	2735	34 34 33	2675	36 11 47	2622	37 50 12	2575
	JUPITER	W.	23 26 32	2199	25 15 1	2186	27 3 50	2174	28 52 57	2163
	α Arietis	E.	37 18 1	2404	35 34 32	2423	33 51 30	2446	32 9 1	2475
	Aldebaran	E.	66 27 18	2167	64 38 1	2162	62 48 36	2157	60 59 3	2151
	Pollux	E.	110 29 46	2137	108 39 43	2130	106 49 30	2124	104 59 7	2118
13	α Aquilæ	W.	79 36 11	2936	81 7 44	2925	82 39 31	2916	84 11 30	2909
	Fomalhaut	W.	46 15 52	2417	47 59 2	2396	49 42 43	2378	51 26 50	2361
	JUPITER	W.	38 2 0	2126	39 52 19	2122	41 42 45	2118	43 33 17	2115
	α Pegasi	W.	33 3 24	3800	34 18 26	3639	35 36 18	3500	36 56 42	3379
	Aldebaran	E.	51 49 51	2139	49 59 52	2139	48 9 52	2139	46 19 53	2141
	Pollux	E.	95 45 9	2095	93 54 2	2092	92 2 51	2090	90 11 37	2088
14	α Aquilæ	W.	91 52 49	2904	93 25 3	2909	94 57 11	2916	96 29 9	2926
	Fomalhaut	W.	60 12 23	2309	61 58 10	2303	63 44 5	2299	65 30 6	2296
	JUPITER	W.	52 46 40	2111	54 37 22	2113	56 28 1	2115	58 18 37	2118
	α Pegasi	W.	44 8 1	2975	45 38 45	2923	47 10 35	2876	48 43 24	2836
	Aldebaran	E.	37 11 13	2168	35 21 57	2178	33 32 56	2190	31 44 14	2204
	Pollux	E.	80 55 4	2089	79 3 48	2091	77 12 35	2094	75 21 27	2098
15	Fomalhaut	W.	74 20 37	2300	76 6 36	2305	77 52 28	2310	79 38 13	2316
	JUPITER	W.	67 30 8	2143	69 20 1	2150	71 9 44	2157	72 59 16	2166
	α Pegasi	W.	56 38 30	2703	58 15 6	2687	59 52 3	2675	61 29 17	2665
	Pollux	E.	66 7 23	2124	64 17 1	2131	62 26 49	2139	60 36 49	2147
	Regulus	E.	102 25 46	2136	100 35 41	2143	98 45 47	2150	96 56 4	2159
16	Fomalhaut	W.	88 24 14	2362	90 8 44	2373	91 52 57	2386	93 36 52	2399
	JUPITER	W.	82 3 29	2216	83 51 33	2228	85 39 19	2241	87 26 46	2253
	α Pegasi	W.	69 37 49	2647	71 15 40	2649	72 53 29	2652	74 31 13	2657
	α Arietis	W.	26 0 42	2687	27 37 40	2642	29 15 38	2608	30 54 22	2581
	Pollux	E.	51 30 21	2199	49 41 52	2210	47 53 40	2223	46 5 47	2237
	Regulus	E.	87 50 55	2208	86 2 40	2220	84 14 43	2233	82 27 4	2245
17	Fomalhaut	W.	102 11 19	2478	103 53 3	2495	105 34 23	2514	107 15 17	2533
	JUPITER	W.	96 19 7	2324	98 4 31	2339	99 49 33	2355	101 34 12	2372
	α Pegasi	W.	82 37 32	2703	84 14 8	2716	85 50 27	2730	87 26 27	2744
	α Arietis	W.	39 14 30	2528	40 55 4	2527	42 35 39	2530	44 16 11	2533
	Pollux	E.	37 11 30	2310	35 25 45	2326	33 40 23	2342	31 55 25	2359
	Regulus	E.	73 33 45	2317	71 48 10	2332	70 2 57	2348	68 18 7	2364
18	JUPITER	W.	110 11 29	2457	111 53 43	2475	113 35 32	2492	115 16 56	2510
	α Pegasi	W.	95 21 12	2832	96 54 58	2852	98 28 18	2873	100 1 11	2895
	α Arietis	W.	52 36 55	2573	54 16 27	2585	55 55 43	2596	57 34 43	2609
	Aldebaran	W.	22 0 9	2626	23 38 28	2618	25 16 58	2616	26 55 31	2613
	Regulus	E.	59 39 59	2450	57 57 36	2469	56 15 39	2487	54 34 7	2505
	Spica	E.	113 42 59	2449	112 0 34	2465	110 18 32	2482	108 36 54	2499
19	JUPITER	W.	123 37 36	2602	125 16 28	2621	126 54 55	2639	128 32 57	2658
	α Arietis	W.	65 45 11	2679	67 22 19	2695	68 59 6	2710	70 35 33	2725
	Aldebaran	W.	35 6 56	2654	36 44 38	2666	38 22 4	2678	39 59 14	2690
	Regulus	E.	46 12 59	2601	44 31 5	2620	42 55 37	2640	41 17 36	2660

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
12	α Aquilæ	W.	73° 33′ 17″	3004	75° 3′ 25″	2983	76° 33′ 59″	2965	78° 4′ 55″	2950
	Fomalhaut	W.	39 29 41	2535	41 10 5	2499	42 51 19	2469	44 33 16	2441
	JUPITER	W.	30 42 20	2153	32 31 58	2145	34 21 48	2138	36 11 49	2132
	α Arietis	E.	30 27 13	2512	28 46 16	2558	27 6 23	2614	25 27 47	2684
	Aldebaran	E.	59 9 22	2147	57 19 35	2145	55 29 44	2142	53 39 49	2140
	Pollux	E.	103 8 35	2112	101 17 54	2107	99 27 6	2103	97 36 11	2098
13	α Aquilæ	W.	85 43 38	2903	87 15 53	2901	88 48 11	2899	90 20 31	2901
	Fomalhaut	W.	53 11 21	2346	54 56 13	2335	56 41 22	2324	58 26 46	2315
	JUPITER	W.	45 23 53	2113	47 14 32	2111	49 5 14	2111	50 55 57	2111
	α Pegasi	W.	38 19 22	3276	39 44 2	3184	41 10 30	3105	42 38 33	3036
	Aldebaran	E.	44 29 57	2144	42 40 5	2148	40 50 19	2153	39 0 41	2160
	Pollux	E.	88 20 20	2067	86 29 1	2067	84 37 42	2067	82 46 23	2067
14	α Aquilæ	W.	98 0 55	2938	99 32 26	2951	101 3 40	2967	102 34 34	2985
	Fomalhaut	W.	67 16 12	2294	69 2 20	2295	70 48 27	2296	72 34 33	2297
	JUPITER	W.	60 9 8	2122	61 59 34	2126	63 49 53	2131	65 40 5	2137
	α Pegasi	W.	50 17 5	2801	51 51 32	2771	53 26 38	2744	55 2 19	2722
	Aldebaran	E.	29 55 53	2922	28 7 58	2943	26 20 34	2967	24 33 46	2995
	Pollux	E.	73 30 24	2101	71 39 27	2106	69 48 37	2111	67 57 55	2118
15	Fomalhaut	W.	81 23 49	2324	83 9 14	2331	84 54 28	2341	86 39 28	2350
	JUPITER	W.	74 48 35	2174	76 37 41	2184	78 26 32	2194	80 15 8	2204
	α Pegasi	W.	63 6 44	2657	64 44 22	2652	66 22 7	2648	67 59 57	2646
	Pollux	E.	58 47 2	2157	56 57 29	2167	55 8 11	2176	53 19 8	2187
	Regulus	E.	95 6 34	2167	93 17 17	2176	91 28 14	2187	89 39 27	2197
16	Fomalhaut	W.	95 20 28	2413	97 3 44	2429	98 46 38	2444	100 29 10	2460
	JUPITER	W.	89 13 55	2266	91 0 44	2280	92 47 13	2294	94 33 21	2309
	α Pegasi	W.	76 8 50	2664	77 46 18	2672	79 23 36	2681	81 0 41	2692
	α Arietis	W.	32 33 43	2561	34 13 31	2547	35 53 39	2538	37 34 0	2531
	Pollux	E.	44 18 14	2250	42 31 1	2264	40 44 9	2279	38 57 38	2294
	Regulus	E.	80 39 43	2258	78 52 42	2272	77 6 2	2287	75 19 43	2301
17	Fomalhaut	W.	108 55 44	2553	110 35 43	2574	112 15 13	2596	113 54 14	2618
	JUPITER	W.	103 18 27	2389	105 2 18	2405	106 45 46	2422	108 28 50	2439
	α Pegasi	W.	89 2 8	2760	90 37 28	2777	92 12 26	2795	93 47 1	2813
	α Arietis	W.	45 56 39	2538	47 36 59	2545	49 17 10	2553	50 57 9	2563
	Pollux	E.	30 10 52	2377	28 26 44	2396	26 43 3	2414	24 59 48	2433
	Regulus	E.	66 33 41	2381	64 49 39	2398	63 6 1	2415	61 22 48	2432
18	JUPITER	W.	116 57 55	2529	118 38 28	2547	120 18 36	2565	121 58 19	2584
	α Pegasi	W.	101 33 36	2918	103 5 32	2941	104 36 59	2965	106 7 55	2991
	α Arietis	W.	59 13 26	2622	60 51 51	2636	62 29 57	2650	64 7 44	2665
	Aldebaran	W.	28 34 4	2620	30 12 32	2626	31 50 51	2634	33 29 0	2643
	Regulus	E.	52 53 1	2524	51 12 21	2543	49 32 7	2562	47 52 20	2581
	Spica	E.	106 55 40	2517	105 14 50	2535	103 34 25	2552	101 54 24	2569
19	JUPITER	W.	130 10 33	2677	131 47 44	2695	133 24 31	2713	135 0 53	2731
	α Arietis	W.	72 11 39	2741	73 47 25	2756	75 22 50	2772	76 57 54	2788
	Aldebaran	W.	41 36 7	2704	43 12 42	2716	44 49 0	2731	46 24 59	2745
	Regulus	E.	39 40 2	2680	38 2 55	2701	36 26 16	2721	34 50 4	2741

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
19	Spica	E.	100° 14′ 47″	2587	98° 35′ 34″	2604	96° 56′ 45″	2622	95° 18′ 20″	2640
	Sun	E.	134 35 5	2912	133 3 1	2931	131 31 21	2950	130 0 6	2969
20	α Arietis	W.	78 32 37	2804	80 7 0	2820	81 41 2	2835	83 14 44	2851
	Aldebaran	W.	48 0 39	2760	49 36 0	2774	51 11 2	2788	52 45 45	2803
	Regulus	E.	33 14 19	2763	31 39 3	2785	30 4 15	2807	28 29 56	2831
	Spica	E.	87 12 7	2725	85 36 1	2742	84 0 17	2759	82 24 55	2775
	Sun	E.	122 29 44	3062	121 0 48	3081	119 32 15	3098	118 4 3	3116
21	α Arietis	W.	90 58 16	2927	92 30 1	2942	94 1 27	2956	95 32 35	2969
	Aldebaran	W.	60 34 44	2872	62 7 39	2886	63 40 16	2898	65 12 37	2911
	Pollux	W.	16 18 6	2876	17 50 56	2884	19 23 35	2894	20 56 2	2904
	Spica	E.	74 33 19	2853	73 0 0	2868	71 27 0	2882	69 54 18	2896
	Sun	E.	110 48 19	3199	109 22 9	3215	107 56 18	3231	106 30 45	3246
22	α Arietis	W.	103 3 57	3037	104 33 24	3050	106 2 35	3062	107 31 31	3073
	Aldebaran	W.	72 50 25	2971	74 21 14	2981	75 51 50	2992	77 22 13	3001
	Pollux	W.	28 35 6	2954	30 6 16	2965	31 37 13	2974	33 7 58	2983
	Spica	E.	62 15 8	2961	60 44 6	2973	59 13 19	2985	57 42 47	2995
	Sun	E.	99 27 14	3313	98 3 18	3326	96 39 37	3338	95 16 9	3349
23	Aldebaran	W.	84 51 13	3045	86 20 30	3053	87 49 37	3060	89 18 36	3066
	Pollux	W.	40 38 59	3025	42 8 41	3032	43 38 14	3039	45 7 39	3044
	Spica	E.	50 13 22	3045	48 44 5	3055	47 15 0	3063	45 46 5	3070
	Sun	E.	88 21 53	3398	86 59 34	3407	85 37 25	3414	84 15 24	3422
24	Aldebaran	W.	96 41 41	3092	98 10 0	3096	99 38 14	3100	101 6 24	3102
	Pollux	W.	52 33 2	3069	54 1 50	3073	55 30 33	3075	56 59 13	3078
	Regulus	W.	16 49 46	3239	18 15 9	3218	19 40 57	3201	21 7 5	3187
	Spica	E.	38 23 51	3108	36 55 51	3114	35 27 59	3121	34 0 15	3128
	Sun	E.	77 27 12	3449	76 5 51	3454	74 44 35	3457	73 23 23	3460
25	Aldebaran	W.	108 26 31	3111	109 54 27	3111	111 22 23	3112	112 50 18	3112
	Pollux	W.	64 21 57	3083	65 50 27	3083	67 18 57	3083	68 47 27	3082
	Regulus	W.	28 21 4	3146	29 48 18	3139	31 15 40	3134	32 43 8	3129
	Sun	E.	66 38 0	3467	65 16 59	3467	63 55 58	3467	62 34 57	3465
26	Pollux	W.	76 10 30	3070	77 39 16	3067	79 8 6	3063	80 37 1	3059
	Regulus	W.	40 2 4	3103	41 30 10	3097	42 58 23	3092	44 26 42	3086
	Sun	E.	55 49 23	3454	54 28 8	3450	53 6 48	3446	51 45 24	3441
27	Pollux	W.	88 3 1	3033	89 32 33	3026	91 2 13	3021	92 32 0	3014
	Regulus	W.	51 50 12	3054	53 19 18	3047	54 48 33	3039	56 17 57	3032
	Sun	E.	44 56 57	3414	43 34 56	3408	42 12 48	3400	40 50 32	3393
28	Pollux	W.	100 3 9	2977	101 33 51	2969	103 4 43	2960	104 35 46	2952
	Regulus	W.	63 47 20	2992	65 17 43	2983	66 48 17	2975	68 19 1	2965
	Sun	E.	33 57 4	3353	32 33 54	3345	31 10 35	3337	29 47 6	3327
29	Regulus	W.	75 55 35	2920	77 27 29	2910	78 59 35	2901	80 31 53	2891
	Spica	W.	22 9 7	3014	23 39 3	2993	25 9 25	2973	26 40 12	2954
	Sun	E.	22 47 2	3289	21 22 29	3272	19 57 45	3263	18 32 50	3254

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P.L. of Diff.	XVh.	P.L. of Diff.	XVIIIh.	P.L. of Diff.	XXIh.	P.L. of Diff.
19	Spica	E.	93° 40′ 19″	2657	92° 2′ 41″	2675	90° 25′ 27″	2692	88° 48′ 36″	2708
	Sun	E.	128 29 15	2988	126 58 47	3007	125 28 43	3026	123 59 2	3044
20	α Arietis	W.	84 48 6	2866	86 21 8	2883	87 53 50	2897	89 26 13	2912
	Aldebaran	W.	54 20 9	2617	55 54 15	2831	57 28 2	2845	59 1 32	2859
	Regulus	E.	26 56 8	2855	25 22 51	2881	23 50 8	2906	22 17 59	2937
	Spica	E.	80 49 54	2792	79 15 15	2807	77 40 56	2823	76 6 58	2838
	Sun	E.	116 36 13	3133	115 8 44	3151	113 41 36	3168	112 14 48	3183
21	α Arietis	W.	97 3 26	2984	98 33 59	2997	100 4 15	3011	101 34 14	3024
	Aldebaran	W.	66 44 42	2924	68 16 31	2936	69 48 4	2948	71 19 22	2960
	Pollux	W.	22 28 16	2913	24 0 18	2924	25 32 7	2934	27 3 43	2944
	Spica	E.	68 21 54	2909	66 49 47	2924	65 17 58	2936	63 46 25	2949
	Sun	E.	105 5 30	3260	103 40 32	3274	102 15 50	3288	100 51 24	3301
22	α Arietis	W.	109 0 13	3085	110 28 41	3097	111 56 54	3108	113 24 54	3120
	Aldebaran	W.	78 52 24	3011	80 22 23	3021	81 52 10	3029	83 21 47	3038
	Pollux	W.	34 38 32	2993	36 8 54	3001	37 39 6	3009	39 9 7	3017
	Spica	E.	56 12 28	3006	54 42 23	3016	53 12 30	3026	51 42 50	3036
	Sun	E.	93 52 54	3360	92 29 52	3370	91 7 1	3380	89 44 22	3389
23	Aldebaran	W.	90 47 27	3072	92 16 11	3078	93 44 47	3083	95 13 17	3088
	Pollux	W.	46 36 57	3051	48 6 7	3056	49 35 11	3060	51 4 9	3065
	Spica	E.	44 17 19	3078	42 48 43	3087	41 20 17	3094	39 52 0	3101
	Sun	E.	82 53 32	3428	81 31 47	3434	80 10 9	3440	78 48 38	3445
24	Aldebaran	W.	102 34 31	3105	104 2 34	3107	105 30 35	3109	106 58 34	3110
	Pollux	W.	58 27 50	3080	59 56 24	3082	61 24 56	3082	62 53 27	3083
	Regulus	W.	22 33 30	3176	24 0 8	3166	25 26 58	3158	26 53 57	3152
	Spica	E.	32 32 39	3135	31 5 12	3142	29 37 53	3149	28 10 43	3158
	Sun	E.	72 2 14	3463	70 41 8	3464	69 20 4	3465	67 59 1	3467
25	Aldebaran	W.	114 18 13	3111	115 46 9	3110	117 14 6	3109	118 42 5	3107
	Pollux	W.	70 15 59	3080	71 44 33	3078	73 13 9	3076	74 41 48	3073
	Regulus	W.	34 10 43	3124	35 38 24	3119	37 6 11	3114	38 34 4	3108
	Sun	E.	61 13 54	3464	59 52 50	3462	58 31 43	3460	57 10 34	3458
26	Pollux	W.	82 6 1	3055	83 35 6	3049	85 4 18	3044	86 33 36	3039
	Regulus	W.	45 55 9	3080	47 23 43	3073	48 52 25	3068	50 21 14	3060
	Sun	E.	50 23 54	3437	49 2 19	3431	47 40 38	3426	46 18 51	3420
27	Pollux	W.	94 1 56	3006	95 32 1	3000	97 2 14	2992	98 32 37	2985
	Regulus	W.	57 47 30	3024	59 17 13	3017	60 47 5	3009	62 17 7	3000
	Sun	E.	39 28 8	3386	38 5 35	3379	36 42 54	3371	35 20 4	3362
28	Pollux	W.	106 6 59	2943	107 38 23	2935	109 9 58	2926	110 41 44	2916
	Regulus	W.	69 49 57	2957	71 21 4	2947	72 52 23	2939	74 23 53	2929
	Sun	E.	28 23 26	3319	26 59 36	3309	25 35 35	3300	24 11 24	3291
29	Regulus	W.	82 4 24	2881	83 37 7	2872	85 10 2	2862	86 43 10	2852
	Spica	W.	28 11 22	2937	29 42 54	2920	31 14 47	2905	32 46 59	2891
	Sun	E.	17 7 45	3246	15 42 30	3237	14 17 5	3230	12 51 31	3223

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	16 29 19.58	10.802	S. 21 49 8.5	−23.35	16 15.89	70.29	10 52.11	0.943
Wed.	2	16 33 39.16	10.829	21 58 16.5	22.30	16 16.04	70.38	10 29.15	0.969
Thur.	3	16 37 59.36	10.854	22 6 59.0	21.23	16 16.19	70.46	10 5.58	0.994
Frid.	4	16 42 20.15	10.878	22 15 15.8	−20.16	16 16.33	70.54	9 41.41	1.018
Sat.	5	16 46 41.51	10.901	22 23 6.7	19.07	16 16.47	70.62	9 16.67	1.041
SUN.	6	16 51 3.40	10.923	22 30 31.3	17.97	16 16.61	70.69	8 51.40	1.063
Mon.	7	16 55 25.80	10.943	22 37 29.5	−16.86	16 16.74	70.76	8 25.64	1.083
Tues.	8	16 59 48.68	10.962	22 44 1.0	15.75	16 16.87	70.83	7 59.40	1.102
Wed.	9	17 4 12.01	10.980	22 50 5.7	14.63	16 17.00	70.89	7 32.70	1.120
Thur.	10	17 8 35.75	10.997	22 55 43.3	−13.50	16 17.12	70.95	7 5.58	1.137
Frid.	11	17 12 59.89	11.012	23 0 53.6	12.36	16 17.24	71.00	6 38.08	1.152
Sat.	12	17 17 24.40	11.027	23 5 36.5	11.22	16 17.35	71.05	6 10.21	1.167
SUN.	13	17 21 49.24	11.040	23 9 51.9	−10.07	16 17.45	71.10	5 42.00	1.180
Mon.	14	17 26 14.39	11.053	23 13 39.7	8.91	16 17.55	71.14	5 13.49	1.192
Tues.	15	17 30 39.82	11.064	23 16 59.6	7.75	16 17.64	71.18	4 44.70	1.204
Wed.	16	17 35 5.50	11.074	23 19 51.6	− 6.58	16 17.73	71.21	4 15.65	1.214
Thur.	17	17 39 31.41	11.083	23 22 15.7	5.41	16 17.81	71.24	3 46.38	1.222
Frid.	18	17 43 57.51	11.091	23 24 11.7	4.24	16 17.88	71.26	3 16.91	1.230
Sat.	19	17 48 23.78	11.097	23 25 39.6	− 3.07	16 17.95	71.28	2 47.28	1.236
SUN.	20	17 52 50.18	11.103	23 26 39.3	1.90	16 18.01	71.29	2 17.52	1.242
Mon.	21	17 57 16.69	11.107	23 27 10.8	− 0.73	16 18.07	71.30	1 47.65	1.246
Tues.	22	18 1 43.28	11.109	23 27 14.1	+ 0.45	16 18.12	71.30	1 17.71	1.248
Wed.	23	18 6 9.90	11.110	23 26 49.1	1.63	16 18.16	71.30	0 47.73	1.249
Thur.	24	18 10 36.52	11.109	23 25 55.8	2.81	16 18.20	71.29	0 17.75	1.248
Frid.	25	18 15 3.11	11.107	23 24 34.2	+ 3.99	16 18.24	71.28	0 12.20	1.246
Sat.	26	18 19 29.64	11.103	23 22 44.3	5.17	16 18.27	71.27	0 42.09	1.242
SUN.	27	18 23 56.06	11.098	23 20 26.2	6.34	16 18.30	71.25	1 11.87	1.237
Mon.	28	18 28 22.34	11.091	23 17 39.9	+ 7.51	16 18.32	71.23	1 41.51	1.231
Tues.	29	18 32 48.45	11.083	23 14 25.5	8.67	16 18.34	71.20	2 10.98	1.223
Wed.	30	18 37 14.34	11.074	23 10 43.2	9.84	16 18.35	71.17	2 40.23	1.213
Thur.	31	18 41 39.98	11.063	23 6 33.0	11.00	16 18.36	71.13	3 9.23	1.202
Frid.	32	18 46 5.33	11.050	S. 23 1 54.9	+12.16	16 18.37	71.09	3 37.94	1.189

NOTE.—The mean time of semidiameter passing may be found by subtracting 0s.19 from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	16 29 21.54	10.800	S. 21 49 12.7	−23.34	10 51.94	0.943	16 40 13.48
Wed.	2	16 33 41.06	10.826	21 58 20.4	22.29	10 28.98	0.969	16 44 10.04
Thur.	3	16 38 1.19	10.851	22 7 2.6	21.23	10 5.41	0.994	16 48 6.60
Frid.	4	16 42 21.91	10.875	22 15 19.1	−20.15	9 41.25	1.018	16 52 3.16
Sat.	5	16 46 43.20	10.898	22 23 9.6	19.06	9 16.52	1.041	16 55 59.72
SUN.	6	16 51 5.02	10.920	22 30 33.9	17.96	8 51.25	1.063	16 59 56.27
Mon.	7	16 55 27.34	10.940	22 37 31.8	−16.85	8 25.49	1.083	17 3 52.83
Tues.	8	16 59 50.14	10.959	22 44 3.1	15.74	7 59.25	1.102	17 7 49.39
Wed.	9	17 4 13.39	10.977	22 50 7.5	14.62	7 32.56	1.120	17 11 45.95
Thur.	10	17 8 37.05	10.994	22 55 44.8	−13.49	7 5.45	1.137	17 15 42.50
Frid.	11	17 13 1.11	11.009	23 0 54.9	12.35	6 37.95	1.152	17 19 39.06
Sat.	12	17 17 25.53	11.024	23 5 37.6	11.21	6 10.09	1.167	17 23 35.62
SUN.	13	17 21 50.29	11.037	23 9 52.8	−10.06	5 41.89	1.180	17 27 32.18
Mon.	14	17 26 15.35	11.050	23 13 40.4	8.90	5 13.39	1.192	17 31 28.74
Tues.	15	17 30 40.69	11.061	23 17 0.2	7.74	4 44.61	1.204	17 35 25.30
Wed.	16	17 35 6.29	11.071	23 19 52.1	− 6.57	4 15.57	1.214	17 39 21.86
Thur.	17	17 39 32.11	11.079	23 22 16.1	5.40	3 46.31	1.222	17 43 18.42
Frid.	18	17 43 58.12	11.087	23 24 12.0	4.24	3 16.85	1.230	17 47 14.97
Sat.	19	17 48 24.30	11.093	23 25 39.8	− 3.07	2 47.23	1.236	17 51 11.53
SUN.	20	17 52 50.61	11.099	23 26 39.5	1.90	2 17.48	1.242	17 55 8.09
Mon.	21	17 57 17.03	11.103	23 27 10.9	− 0.73	1 47.62	1.246	17 59 4.65
Tues.	22	18 1 43.52	11.105	23 27 14.1	+ 0.45	1 17.69	1.248	18 3 1.21
Wed.	23	18 6 10.05	11.106	23 26 49.1	1.63	0 47.72	1.249	18 6 57.77
Thur.	24	18 10 36.58	11.105	23 25 55.8	2.81	0 17.75	1.248	18 10 54.33
Frid.	25	18 15 3.08	11.103	23 24 34.2	+ 3.99	0 12.19	1.246	18 14 50.89
Sat.	26	18 19 29.51	11.099	23 22 44.3	5.17	0 42.07	1.242	18 18 47.44
SUN.	27	18 23 55.84	11.094	23 20 26.3	6.34	1 11.84	1.237	18 22 44.00
Mon.	28	18 28 22.03	11.088	23 17 40.1	+ 7.51	1 41.47	1.231	18 26 40.56
Tues.	29	18 32 48.05	11.080	23 14 25.9	8.67	2 10.93	1.223	18 30 37.12
Wed.	30	18 37 13.85	11.070	23 10 43.6	9.84	2 40.17	1.213	18 34 33.68
Thur.	31	18 41 39.40	11.059	23 6 33.5	11.00	3 9.16	1.202	18 38 30.24
Frid.	32	18 46 4.66	11.046	S. 23 1 55.6	+12.16	3 37.87	1.189	18 42 26.79

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 hour, +9^{s}.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	335	249 2 56.4	2 25.2	152.20	− 0.31	9.9937740	−28.2	7 18 34.47
2	336	250 3 49.6	3 18.2	152.24	0.43	9.9937068	27.7	7 14 38.56
3	337	251 4 43.8	4 12.3	152.28	0.54	9.9936410	27.1	7 10 42.65
4	338	252 5 39.0	5 7.3	152.31	− 0.62	9.9935766	−26.5	7 6 46.74
5	339	253 6 35.0	6 3.1	152.35	0.67	9.9935137	25.9	7 2 50.82
6	340	254 7 31.8	6 59.7	152.38	0.70	9.9934524	25.2	6 58 54.91
7	341	255 8 29.3	7 57.0	152.41	− 0.70	9.9933927	−24.5	6 54 59.00
8	342	256 9 27.4	8 55.0	152.44	0.67	9.9933349	23.7	6 51 3.09
9	343	257 10 26.2	9 53.6	152.47	0.60	9.9932792	22.8	6 47 7.18
10	344	258 11 25.6	10 52.8	152.49	− 0.51	9.9932256	−21.9	6 43 11.27
11	345	259 12 25.5	11 52.5	152.51	0.40	9.9931744	20.9	6 39 15.36
12	346	260 13 25.9	12 52.7	152.53	0.28	9.9931256	19.8	6 35 19.44
13	347	261 14 26.9	13 53.5	152.56	− 0.15	9.9930794	−18.7	6 31 23.52
14	348	262 15 28.5	14 54.9	152.58	− 0.01	9.9930359	17.6	6 27 27.61
15	349	263 16 30.7	15 56.9	152.61	+ 0.12	9.9929951	16.5	6 23 31.70
16	350	264 17 33.6	16 59.6	152.63	+ 0.23	9.9929570	−15.3	6 19 35.79
17	351	265 18 37.1	18 3.0	152.66	0.32	9.9929217	14.1	6 15 39.87
18	352	266 19 41.3	19 7.0	152.69	0.39	9.9928891	13.0	6 11 43.96
19	353	267 20 46.2	20 11.7	152.72	+ 0.43	9.9928592	−11.9	6 7 48.05
20	354	268 21 51.9	21 17.2	152.75	0.45	9.9928319	10.9	6 3 52.14
21	355	269 22 58.3	22 23.4	152.78	0.43	9.9928071	9.8	5 59 56.22
22	356	270 24 5.4	23 30.3	152.81	+ 0.38	9.9927848	− 8.8	5 56 0.31
23	357	271 25 13.1	24 37.8	152.84	0.31	9.9927649	7.9	5 52 4.40
24	358	272 26 21.5	25 46.0	152.86	0.22	9.9927472	7.0	5 48 8.49
25	359	273 27 30.6	26 54.9	152.89	+ 0.10	9.9927315	− 6.2	5 44 12.57
26	360	274 28 40.2	28 4.4	152.91	− 0.03	9.9927177	5.4	5 40 16.66
27	361	275 29 50.3	29 14.3	152.93	0.16	9.9927058	4.6	5 36 20.75
28	362	276 31 0.8	30 24.6	152.94	− 0.29	9.9926958	− 3.8	5 32 24.84
29	363	277 32 11.6	31 35.2	152.95	0.41	9.9926875	3.1	5 28 28.92
30	364	278 33 22.6	32 46.0	152.96	0.51	9.9926808	2.4	5 24 33.01
31	365	279 34 33.8	33 57.0	152.96	0.60	9.9926758	1.7	5 20 37.10
32	366	280 35 45.0	35 8.0	152.96	− 0.66	9.9926724	− 1.0	5 16 41.19

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′, to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
— $9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 16.4	15 20.5	55 56.7	+1.25	56 11.7	+1.26	☌		0.0
2	15 24.6	15 28.7	56 26.8	1.26	56 41.8	1.24	0 41.8	2.28	1.0
3	15 32.7	15 36.6	56 56.5	1.22	57 10.9	1.19	1 38.0	2.37	2.0
4	15 40.5	15 44.2	57 24.9	+1.16	57 38.6	+1.13	2 35.6	2.39	3.0
5	15 47.8	15 51.2	57 51.8	1.09	58 4.5	1.05	3 32.7	2.34	4.0
6	15 54.6	15 57.8	58 16.8	1.01	58 28.6	0.97	4 27.9	2.25	5.0
7	16 0.9	16 3.8	58 39.9	+0.92	58 50.6	+0.87	5 20.5	2.15	6.0
8	16 6.5	16 9.0	59 0.6	0.80	59 9.8	0.73	6 10.9	2.07	7.0
9	16 11.3	16 13.2	59 18.0	0.64	59 25.0	0.53	6 59.8	2.03	8.0
10	16 14.7	16 15.8	59 30.6	+0.40	59 34.6	+0.26	7 48.5	2.05	9.0
11	16 16.3	16 16.4	59 36.7	+0.10	59 36.8	−0.10	8 38.2	2.12	10.0
12	16 15.7	16 14.5	59 34.5	−0.30	59 29.8	0.50	9 30.2	2.22	11.0
13	16 12.5	16 9.8	59 22.6	−0.71	59 12.8	−0.92	10 25.0	2.34	12.0
14	16 6.5	16 2.5	59 0.6	1.12	58 46.0	1.31	11 22.7	2.44	13.0
15	15 58.0	15 52.9	58 29.3	1.47	58 10.7	1.61	12 22.1	2.47	14.0
16	15 47.5	15 41.7	57 50.7	−1.71	57 29.6	−1.79	13 21.2	2.41	15.0
17	15 35.8	15 29.8	57 7.9	1.82	56 45.9	1.82	14 17.9	2.28	16.0
18	15 23.9	15 18.2	56 24.2	1.79	56 3.1	1.72	15 10.6	2.11	17.0
19	15 12.7	15 7.7	55 43.1	−1.61	55 24.5	−1.49	15 59.2	1.94	18.0
20	15 3.0	14 59.0	55 7.5	1.34	54 52.5	1.16	16 43.9	1.80	19.0
21	14 55.5	14 52.6	54 39.7	0.97	54 29.3	0.77	17 25.7	1.71	20.0
22	14 50.5	14 49.1	54 21.4	−0.56	54 16.1	−0.33	18 5.8	1.66	21.0
23	14 48.3	14 48.3	54 13.5	−0.11	54 13.5	+0.12	18 45.2	1.65	22.0
24	14 49.1	14 50.5	54 16.2	+0.34	54 21.4	0.54	19 25.1	1.70	23.0
25	14 52.6	14 55.3	54 29.1	+0.75	54 39.2	+0.94	20 6.7	1.79	24.0
26	14 58.7	15 2.5	54 51.4	1.10	55 5.5	1.26	20 51.0	1.92	25.0
27	15 6.8	15 11.5	55 21.2	1.37	55 38.4	1.48	21 39.0	2.08	26.0
28	15 16.4	15 21.6	55 56.6	+1.56	56 15.6	+1.60	22 31.1	2.25	27.0
29	15 26.8	15 32.1	56 34.9	1.62	56 54.3	1.61	23 27.1	2.38	28.0
30	15 37.3	15 42.3	57 13.4	1.56	57 31.8	1.50	☌		29.0
31	15 47.1	15 51.5	57 49.2	1.40	58 5.4	1.29	0 25.5	2.45	0.4
32	15 55.5	15 59.0	58 20.1	+1.16	58 33.1	+1.09	1 24.5	2.47	1.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	16 29 5.53	2.2368	S.23 0 23.1	7.692
1	16 31 19.92	2.2427	23 8 1.2	7.579
2	16 33 34.66	2.2487	23 15 32.5	7.465
3	16 35 49.76	2.2546	23 22 57.0	7.350
4	16 38 5.21	2.2604	23 30 14.5	7.233
5	16 40 21.00	2.2661	23 37 25.0	7.116
6	16 42 37.14	2.2719	23 44 28.4	6.997
7	16 44 53.62	2.2776	23 51 24.6	6.877
8	16 47 10.45	2.2833	23 58 13.6	6.756
9	16 49 27.62	2.2889	24 4 55.3	6.633
10	16 51 45.12	2.2945	24 11 29.6	6.509
11	16 54 2.96	2.3001	24 17 56.4	6.384
12	16 56 21.13	2.3056	24 24 15.7	6.258
13	16 58 39.63	2.3110	24 30 27.4	6.131
14	17 0 58.45	2.3164	24 36 31.4	6.003
15	17 3 17.60	2.3218	24 42 27.8	5.875
16	17 5 37.07	2.3272	24 48 16.4	5.744
17	17 7 56.86	2.3324	24 53 57.1	5.612
18	17 10 16.96	2.3376	24 59 29.9	5.480
19	17 12 37.37	2.3427	25 4 54.7	5.347
20	17 14 58.08	2.3477	25 10 11.5	5.212
21	17 17 19.10	2.3527	25 15 20.1	5.076
22	17 19 40.41	2.3576	25 20 20.5	4.938
23	17 22 2.01	2.3625	S.25 25 12.7	4.801

WEDNESDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	17 24 23.91	2.3673	S.25 29 56.6	4.662
1	17 26 46.09	2.3720	25 34 32.1	4.522
2	17 29 8.55	2.3766	25 38 59.2	4.382
3	17 31 31.28	2.3811	25 43 17.9	4.240
4	17 33 54.28	2.3855	25 47 28.0	4.097
5	17 36 17.54	2.3899	25 51 29.5	3.953
6	17 38 41.07	2.3942	25 55 22.4	3.809
7	17 41 4.85	2.3984	25 59 6.6	3.663
8	17 43 28.88	2.4025	26 2 42.0	3.517
9	17 45 53.15	2.4065	26 6 8.6	3.370
10	17 48 17.66	2.4104	26 9 26.4	3.222
11	17 50 42.40	2.4142	26 12 35.3	3.073
12	17 53 7.36	2.4179	26 15 35.2	2.923
13	17 55 32.54	2.4215	26 18 26.1	2.773
14	17 57 57.94	2.4251	26 21 8.0	2.622
15	18 0 23.55	2.4285	26 23 40.8	2.470
16	18 2 49.36	2.4318	26 26 4.4	2.318
17	18 5 15.36	2.4350	26 28 18.9	2.165
18	18 7 41.56	2.4382	26 30 24.2	2.011
19	18 10 7.94	2.4411	26 32 20.2	1.856
20	18 12 34.49	2.4439	26 34 6.9	1.701
21	18 15 1.21	2.4467	26 35 44.3	1.545
22	18 17 28.09	2.4493	26 37 12.3	1.389
23	18 19 55.13	2.4519	26 38 31.0	1.233
24	18 22 22.32	2.4543	S.26 39 40.3	1.076

THURSDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 22 22.32	2.4543	S.26 39 40.3	1.076
1	18 24 49.65	2.4566	26 40 40.1	0.918
2	18 27 17.11	2.4587	26 41 30.4	0.759
3	18 29 44.70	2.4608	26 42 11.2	0.600
4	18 32 12.41	2.4628	26 42 42.4	0.441
5	18 34 40.24	2.4647	26 43 4.1	0.282
6	18 37 8.17	2.4663	26 43 16.3	− 0.123
7	18 39 36.20	2.4679	26 43 18.9	+ 0.037
8	18 42 4.32	2.4694	26 43 11.8	0.198
9	18 44 32.53	2.4707	26 42 55.1	0.359
10	18 47 0.81	2.4719	26 42 28.7	0.520
11	18 49 29.16	2.4731	26 41 52.7	0.681
12	18 51 57.58	2.4741	26 41 7.0	0.842
13	18 54 26.05	2.4749	26 40 11.6	1.004
14	18 56 54.57	2.4757	26 39 6.5	1.165
15	18 59 23.13	2.4763	26 37 51.8	1.326
16	19 1 51.72	2.4768	26 36 27.4	1.488
17	19 4 20.34	2.4772	26 34 53.2	1.651
18	19 6 48.98	2.4774	26 33 9.3	1.813
19	19 9 17.63	2.4775	26 31 15.7	1.974
20	19 11 46.28	2.4775	26 29 12.4	2.136
21	19 14 14.93	2.4774	26 26 59.4	2.297
22	19 16 43.57	2.4772	26 24 36.7	2.459
23	19 19 12.19	2.4768	S.26 22 4.3	2.620

FRIDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	19 21 40.79	2.4764	S.26 19 22.3	2.781
1	19 24 9.36	2.4758	26 16 30.6	2.942
2	19 26 37.89	2.4751	26 13 29.2	3.104
3	19 29 6.37	2.4742	26 10 18.1	3.265
4	19 31 34.80	2.4733	26 6 57.4	3.425
5	19 34 3.17	2.4723	26 3 27.1	3.586
6	19 36 31.48	2.4712	25 59 47.1	3.746
7	19 38 59.72	2.4700	25 55 57.6	3.905
8	19 41 27.88	2.4686	25 51 58.5	4.065
9	19 43 55.95	2.4671	25 47 49.8	4.224
10	19 46 23.93	2.4655	25 43 31.6	4.382
11	19 48 51.81	2.4638	25 39 4.0	4.539
12	19 51 19.59	2.4621	25 34 26.9	4.697
13	19 53 47.26	2.4602	25 29 40.3	4.855
14	19 56 14.81	2.4582	25 24 44.3	5.011
15	19 58 42.24	2.4562	25 19 39.0	5.166
16	20 1 9.55	2.4540	25 14 24.4	5.321
17	20 3 36.72	2.4517	25 9 0.5	5.476
18	20 6 3.75	2.4493	25 3 27.3	5.631
19	20 8 30.64	2.4469	24 57 44.8	5.784
20	20 10 57.38	2.4443	24 51 53.2	5.937
21	20 13 23.96	2.4417	24 45 52.4	6.089
22	20 15 50.38	2.4390	24 39 42.5	6.240
23	20 18 16.64	2.4362	24 33 23.6	6.391
24	20 20 42.73	2.4333	S.24 26 55.6	6.542

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 20 42.73	2.4333	S.24 26 55.6	6.542	0	22 13 18.60	2.2508	S.16 38 12.8	12.562
1	20 23 8.64	2.4304	24 20 18.6	6.691	1	22 15 33.53	2.2470	16 25 36.2	12.658
2	20 25 34.38	2.4275	24 13 32.7	6.839	2	22 17 48.24	2.2432	16 12 53.9	12.753
3	20 27 59.94	2.4244	24 6 37.9	6.987	3	22 20 2.72	2.2395	16 0 5.9	12.847
4	20 30 25.31	2.4213	23 59 34.3	7.134	4	22 22 16.98	2.2357	15 47 12.3	12.939
5	20 32 50.49	2.4181	23 52 21.9	7.280	5	22 24 31.01	2.2320	15 34 13.2	13.030
6	20 35 15.48	2.4148	23 45 0.7	7.426	6	22 26 44.82	2.2284	15 21 8.7	13.120
7	20 37 40.27	2.4115	23 37 30.8	7.570	7	22 28 58.42	2.2248	15 7 58.8	13.209
8	20 40 4.86	2.4081	23 29 52.3	7.712	8	22 31 11.80	2.2212	14 54 43.6	13.296
9	20 42 29.24	2.4046	23 22 5.3	7.854	9	22 33 24.97	2.2177	14 41 23.3	13.381
10	20 44 53.41	2.4011	23 14 9.8	7.996	10	22 35 37.93	2.2142	14 27 57.9	13.466
11	20 47 17.37	2.3975	23 6 5.8	8.137	11	22 37 50.68	2.2108	14 14 27.4	13.550
12	20 49 41.11	2.3939	22 57 53.3	8.277	12	22 40 3.23	2.2075	14 0 51.9	13.632
13	20 52 4.64	2.3902	22 49 32.5	8.416	13	22 42 15.58	2.2042	13 47 11.6	13.712
14	20 54 27.94	2.3865	22 41 3.4	8.553	14	22 44 27.73	2.2009	13 33 26.5	13.792
15	20 56 51.02	2.3827	22 32 26.1	8.690	15	22 46 39.69	2.1977	13 19 36.6	13.871
16	20 59 13.87	2.3790	22 23 40.6	8.826	16	22 48 51.45	2.1945	13 5 42.1	13.946
17	21 1 36.50	2.3752	22 14 47.0	8.960	17	22 51 3.03	2.1914	12 51 43.1	14.021
18	21 3 58.90	2.3713	22 5 45.4	9.093	18	22 53 14.42	2.1883	12 37 39.6	14.095
19	21 6 21.06	2.3674	21 56 35.8	9.226	19	22 55 25.63	2.1653	12 23 31.7	14.167
20	21 8 42.99	2.3635	21 47 18.3	9.357	20	22 57 36.66	2.1824	12 9 19.5	14.239
21	21 11 4.68	2.3595	21 37 52.9	9.488	21	22 59 47.52	2.1796	11 55 3.0	14.309
22	21 13 26.13	2.3556	21 28 19.7	9.617	22	23 1 58.21	2.1767	11 40 42.4	14.377
23	21 15 47.35	2.3517	S.21 18 38.8	9.745	23	23 4 8.73	2.1739	S.11 26 17.7	14.445
	SUNDAY 6.					**TUESDAY 8.**			
0	21 18 8.33	2.3477	S.21 8 50.3	9.872	0	23 6 19.08	2.1712	S.11 11 49.0	14.512
1	21 20 29.07	2.3436	20 58 54.2	9.998	1	23 8 29.27	2.1686	10 57 16.3	14.576
2	21 22 49.56	2.3395	20 48 50.6	10.123	2	23 10 39.31	2.1661	10 42 39.9	14.638
3	21 25 9.81	2.3354	20 38 39.5	10.247	3	23 12 49.20	2.1636	10 27 59.8	14.699
4	21 27 29.81	2.3313	20 28 21.0	10.369	4	23 14 58.94	2.1612	10 13 16.0	14.761
5	21 29 49.57	2.3272	20 17 55.2	10.490	5	23 17 8.54	2.1588	9 58 28.5	14.821
6	21 32 9.08	2.3232	20 7 22.2	10.610	6	23 19 17.99	2.1564	9 43 37.5	14.878
7	21 34 28.35	2.3191	19 56 42.0	10.729	7	23 21 27.31	2.1542	9 28 43.1	14.934
8	21 36 47.37	2.3149	19 45 54.7	10.847	8	23 23 36.50	2.1521	9 13 45.4	14.989
9	21 39 6.14	2.3108	19 35 0.4	10.963	9	23 25 45.56	2.1500	8 58 44.4	15.043
10	21 41 24.67	2.3067	19 23 59.2	11.078	10	23 27 54.50	2.1480	8 43 40.2	15.096
11	21 43 42.95	2.3027	19 12 51.0	11.193	11	23 30 3.32	2.1460	8 28 32.9	15.147
12	21 46 0.99	2.2986	19 1 36.0	11.306	12	23 32 12.02	2.1441	8 13 22.6	15.197
13	21 48 18.78	2.2945	18 50 14.3	11.417	13	23 34 20.61	2.1423	7 58 9.3	15.245
14	21 50 36.33	2.2905	18 38 45.9	11.527	14	23 36 29.10	2.1406	7 42 53.2	15.291
15	21 52 53.64	2.2864	18 27 11.0	11.636	15	23 38 37.49	2.1390	7 27 34.4	15.336
16	21 55 10.70	2.2823	18 15 29.6	11.744	16	23 40 45.78	2.1374	7 12 12.9	15.381
17	21 57 27.52	2.2783	18 3 41.7	11.852	17	23 42 53.98	2.1358	6 56 48.7	15.424
18	21 59 44.10	2.2743	17 51 47.4	11.957	18	23 45 2.08	2.1344	6 41 22.0	15.465
19	22 2 0.44	2.2703	17 39 46.9	12.060	19	23 47 10.10	2.1331	6 25 52.9	15.505
20	22 4 16.54	2.2664	17 27 40.2	12.163	20	23 49 18.05	2.1318	6 10 21.4	15.544
21	22 6 32.41	2.2625	17 15 27.3	12.265	21	23 51 25.92	2.1306	5 54 47.6	15.582
22	22 8 48.04	2.2586	17 3 8.4	12.364	22	23 53 33.72	2.1295	5 39 11.6	15.618
23	22 11 3.44	2.2547	16 50 43.6	12.463	23	23 55 41.46	2.1285	5 23 33.5	15.652
24	22 13 18.60	2.2508	S.16 38 12.8	12.562	24	23 57 49.14	2.1275	S. 5 7 53.4	15.685

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					FRIDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 57 49.14	2.1275	S. 5 7 53.4	15.685	0	1 40 22.34	2.1766	N. 7 35 53.8	15.571
1	23 59 56.76	2.1266	4 52 11.3	15.717	1	1 42 33.02	2.1795	7 51 26.9	15.532
2	0 2 4.33	2.1257	4 36 27.4	15.747	2	1 44 43.88	2.1826	8 6 57.6	15.490
3	0 4 11.85	2.1250	4 20 41.7	15.776	3	1 46 54.93	2 1857	8 22 25.7	15.447
4	0 6 19.33	2.1244	4 4 54.3	15.803	4	1 49 6.16	2.1888	8 37 51.2	15.402
5	0 8 26.78	2.1239	3 49 5.3	15.829	5	1 51 17.58	2.1920	8 53 14.0	15.357
6	0 10 34.20	2.1234	3 33 14.8	15.854	6	1 53 29.20	2.1953	9 8 34.0	15.309
7	0 12 41.59	2.1230	3 17 22.8	15.877	7	1 55 41.02	2.1986	9 23 51.1	15.260
8	0 14 48.96	2.1227	3 1 29.5	15.898	8	1 57 53.04	2.2020	9 39 5.2	15.209
9	0 16 56.31	2.1224	2 45 35.0	15.918	9	2 0 5.26	2.2055	9 54 16.2	15.157
10	0 19 3.65	2.1222	2 29 39.3	15.938	10	2 2 17.70	2.2091	10 9 24.0	15.103
11	0 21 10.98	2.1222	2 13 42.4	15.957	11	2 4 30.35	2.2127	10 24 28.5	15.047
12	0 23 18.31	2.1222	1 57 44.5	15.973	12	2 6 43.22	2.2163	10 39 29.6	14.989
13	0 25 25.65	2.1223	1 41 45.7	15.987	13	2 8 56.31	2.2201	10 54 27.2	14.931
14	0 27 32.99	2.1224	1 25 46.1	16.000	14	2 11 9.63	2.2239	11 9 21.3	14.870
15	0 29 40.34	2.1227	1 9 45.7	16.012	15	2 13 23.18	2.2278	11 24 11.6	14.807
16	0 31 47.71	2.1231	0 53 44.6	16.023	16	2 15 36.96	2.2317	11 38 58.1	14.743
17	0 33 55.11	2.1235	0 37 42.9	16.032	17	2 17 50.98	2.2356	11 53 40.8	14.678
18	0 36 2.53	2.1240	0 21 40.8	16.039	18	2 20 5.23	2.2395	12 8 19.5	14.611
19	0 38 9.99	2.1246	S. 0 5 38.3	16.045	19	2 22 19.72	2.2436	12 22 54.1	14.549
20	0 40 17.49	2.1252	N. 0 10 24.6	16.051	20	2 24 34.46	2.2478	12 37 24.5	14.472
21	0 42 25.02	2.1259	0 26 27.8	16.054	21	2 26 49.46	2.2521	12 51 50.7	14.400
22	0 44 32.60	2.1268	0 42 31.1	16.055	22	2 29 4.71	2.2562	13 6 12.5	14.326
23	0 46 40.24	2.1277	N. 0 58 34.4	16.055	23	2 31 20.21	2.2604	N.13 20 29.8	14.250
	THURSDAY 10.					SATURDAY 12.			
0	0 48 47.93	2.1287	N. 1 14 37.7	16.053	0	2 33 35.96	2.2647	N.13 34 42.5	14.172
1	0 50 55.68	2.1298	1 30 40.8	16.051	1	2 35 51.97	2.2691	13 48 50.5	14.094
2	0 53 3.50	2.1310	1 46 43.8	16.047	2	2 38 8.25	2.2735	14 2 53.8	14.014
3	0 55 11.40	2.1322	2 2 46.5	16.042	3	2 40 24.79	2.2779	14 16 52.2	13.932
4	0 57 19.37	2.1336	2 18 48.8	16.034	4	2 42 41.60	2.2823	14 30 45.6	13.848
5	0 59 27.43	2.1350	2 34 50.6	16.026	5	2 44 58.67	2.2867	14 44 33.9	13.763
6	1 1 35.57	2.1364	2 50 51.9	16.016	6	2 47 16.01	2.2913	14 58 17.1	13.676
7	1 3 43.80	2.1380	3 6 52.5	16.004	7	2 49 33.63	2.2959	15 11 55.0	13.587
8	1 5 52.13	2.1396	3 22 52.4	15.991	8	2 51 51.52	2.3005	15 25 27.5	13.496
9	1 8 0.56	2.1413	3 38 51.4	15.976	9	2 54 9.69	2.3052	15 38 54.5	13.404
10	1 10 9.09	2.1432	3 54 49.5	15.960	10	2 56 28.14	2.3098	15 52 16.0	13.311
11	1 12 17.74	2.1451	4 10 46.6	15.942	11	2 58 46.87	2.3144	16 5 31.8	13.215
12	1 14 26.50	2.1470	4 26 42.5	15.922	12	3 1 5.87	2.3191	16 18 41.8	13.118
13	1 16 35.38	2.1491	4 42 37.2	15.902	13	3 3 25.16	2.3238	16 31 46.0	13.020
14	1 18 44.39	2.1512	4 58 30.7	15.880	14	3 5 44.73	2.3286	16 44 44.2	12.919
15	1 20 53.53	2.1534	5 14 22.8	15.856	15	3 8 4.59	2.3333	16 57 36.3	12 817
16	1 23 2.80	2.1557	5 30 13.4	15.830	16	3 10 24.73	2.3381	17 10 22.3	12.714
17	1 25 12.21	2.1580	5 46 2.4	15.803	17	3 12 45.16	2.3429	17 23 2.0	12.609
18	1 27 21.76	2.1604	6 1 49.8	15.775	18	3 15 5.88	2.3477	17 35 35.4	12.502
19	1 29 31.46	2.1629	6 17 35.4	15.745	19	3 17 26.88	2.3524	17 48 2.3	12.394
20	1 31 41.31	2.1655	6 33 19.2	15.713	20	3 19 48.17	2.3572	18 0 22.7	12.285
21	1 33 51.32	2.1682	6 49 1.0	15.680	21	3 22 9.75	2.3621	18 12 36.5	12.173
22	1 36 1.49	2.1709	7 4 40.8	15.645	22	3 24 31.62	2.3668	18 24 43.5	12.060
23	1 38 11.83	2.1737	7 20 18.4	15.608	23	3 26 53.77	2.3716	18 36 43.7	11.945
24	1 40 22.34	2.1766	N. 7 35 53.8	15.571	24	3 29 16.21	2.3764	N.18 48 36.9	11.828

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 13.					**TUESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 29 16.21	2.3764	N.18 48 36.9	11.828	0	5 28 4.24	2.5449	N.25 36 29.0	4.737
1	3 31 38.94	2.3812	19 0 23.1	11.711	1	5 30 36.97	2.5461	25 41 8.1	4.567
2	3 34 1.95	2.3859	19 12 2.2	11.592	2	5 33 9.77	2.5471	25 45 37.1	4.398
3	3 36 25.25	2.3907	19 23 34.2	11.472	3	5 35 42.62	2.5479	25 49 55.9	4.228
4	3 38 48.83	2.3954	19 34 58.8	11.349	4	5 38 15.52	2.5487	25 54 4.5	4.057
5	3 41 12.69	2.4001	19 46 16.0	11.225	5	5 40 48.47	2.5494	25 58 2.8	3.886
6	3 43 36.84	2.4048	19 57 25.8	11.100	6	5 43 21.45	2.5499	26 1 50.8	3.714
7	3 46 1.27	2.4095	20 8 28.0	10.972	7	5 45 54.46	2.5502	26 5 28.5	3.543
8	3 48 25.98	2.4141	20 19 22.5	10.844	8	5 48 27.48	2.5504	26 8 55.9	3.372
9	3 50 50.96	2.4187	20 30 9.3	10.715	9	5 51 0.51	2.5505	26 12 13.1	3.200
10	3 53 16.22	2.4232	20 40 48.3	10.584	10	5 53 33.54	2.5504	26 15 19.9	3.028
11	3 55 41.75	2.4277	20 51 19.4	10.451	11	5 56 6.56	2.5502	26 18 16.4	2.856
12	3 58 7.55	2.4322	21 1 42.4	10.316	12	5 58 39.57	2.5499	26 21 2.6	2.684
13	4 0 33.62	2.4367	21 11 57.3	10.181	13	6 1 12.55	2.5494	26 23 38.5	2.512
14	4 2 59.96	2.4412	21 22 4.1	10.045	14	6 3 45.50	2.5487	26 26 4.0	2.339
15	4 5 26.56	2.4455	21 32 2.7	9.907	15	6 6 18.40	2.5479	26 28 19.2	2.167
16	4 7 53.42	2.4498	21 41 52.9	9.767	16	6 8 51.25	2.5470	26 30 24.1	1.996
17	4 10 20.54	2.4541	21 51 34.7	9.627	17	6 11 24.04	2.5460	26 32 18.7	1.824
18	4 12 47.92	2.4584	22 1 8.1	9.485	18	6 13 56.77	2.5448	26 34 3.0	1.653
19	4 15 15.55	2.4625	22 10 32.9	9.341	19	6 16 29.42	2.5434	26 35 37.0	1.482
20	4 17 43.42	2.4666	22 19 49.0	9.196	20	6 19 1.98	2.5419	26 37 0.8	1.311
21	4 20 11.54	2.4707	22 28 56.4	9.050	21	6 21 34.45	2.5403	26 38 14.3	1.140
22	4 22 39.90	2.4746	22 37 55.0	8.903	22	6 24 6.82	2.5386	26 39 17.6	0.970
23	4 25 8.49	2.4784	N.22 46 44.8	8.756	23	6 26 39.08	2.5366	N.26 40 10.7	0.799
	MONDAY 14.					**WEDNESDAY 16.**			
0	4 27 37.30	2.4821	N.22 55 25.7	8.607	0	6 29 11.21	2.5344	N.26 40 53.5	0.629
1	4 30 6.34	2.4859	23 3 57.6	8.456	1	6 31 43.21	2.5322	26 41 26.2	0.460
2	4 32 35.61	2.4897	23 12 20.4	8.303	2	6 34 15.08	2.5300	26 41 48.7	0.291
3	4 35 5.10	2.4933	23 20 34.0	8.150	3	6 36 46.82	2.5276	26 42 1.1	+ 0.123
4	4 37 34.80	2.4967	23 28 38.4	7.997	4	6 39 18.40	2.5249	26 42 3.4	− 0.045
5	4 40 4.71	2.5001	23 36 33.6	7.842	5	6 41 49.81	2.5221	26 41 55.7	0.213
6	4 42 34.81	2.5034	23 44 19.4	7.685	6	6 44 21.05	2.5192	26 41 37.9	0.380
7	4 45 5.11	2.5066	23 51 55.8	7.528	7	6 46 52.12	2.5163	26 41 10.1	0.546
8	4 47 35.60	2.5097	23 59 22.8	7.371	8	6 49 23.00	2.5131	26 40 32.4	0.711
9	4 50 6.28	2.5128	24 6 40.3	7.212	9	6 51 53.69	2.5099	26 39 44.8	0.876
10	4 52 37.14	2.5157	24 13 48.2	7.052	10	6 54 24.19	2.5065	26 38 47.3	1.040
11	4 55 8.17	2.5185	24 20 46.5	6.892	11	6 56 54.47	2.5029	26 37 40.0	1.204
12	4 57 39.36	2.5212	24 27 35.2	6.731	12	6 59 24.53	2.4992	26 36 22.8	1.367
13	5 0 10.71	2.5238	24 34 14.2	6.568	13	7 1 54.77	2.4955	26 34 55.9	1.529
14	5 2 42.22	2.5264	24 40 43.4	6.404	14	7 4 23.99	2.4917	26 33 19.3	1.690
15	5 5 13.88	2.5288	24 47 2.7	6.240	15	7 6 53.37	2.4876	26 31 33.1	1.851
16	5 7 45.68	2.5311	24 53 12.2	6.076	16	7 9 22.50	2.4834	26 29 37.2	2.011
17	5 10 17.61	2.5332	24 59 11.8	5.911	17	7 11 51.38	2.4792	26 27 31.8	2.169
18	5 12 49.67	2.5353	25 5 1.5	5.745	18	7 14 20.00	2.4748	26 25 16.9	2.327
19	5 15 21.85	2.5372	25 10 41.2	5.578	19	7 16 48.35	2.4703	26 22 52.6	2.484
20	5 17 54.14	2.5390	25 16 10.9	5.411	20	7 19 16.44	2.4658	26 20 18.8	2.641
21	5 20 26.53	2.5406	25 21 30.6	5.244	21	7 21 44.25	2.4612	26 17 35.7	2.795
22	5 22 59.01	2.5421	25 26 40.2	5.076	22	7 24 11.78	2.4563	26 14 43.4	2.949
23	5 25 31.58	2.5436	25 31 39.7	4.907	23	7 26 39.01	2.4513	26 11 41.9	3.102
24	5 28 4.24	2.5449	N.25 36 29.0	4.737	24	7 29 5.94	2.4463	N.26 8 31.2	3.254

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					**SATURDAY 19.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 29 5.94	2.4463	N.26 8 31.2	3.254	0	9 19 32.80	2.1432	N.20 59 52.9	9.114
1	7 31 32.57	2.4413	26 5 11.4	3.405	1	9 21 41.19	2.1365	20 50 43.3	9.205
2	7 33 58.90	2.4361	26 1 42.6	3.554	2	9 23 49.18	2.1298	20 41 28.3	9.294
3	7 36 24.91	2.4308	25 58 4.9	3.703	3	9 25 56.77	2.1232	20 32 8.0	9.382
4	7 38 50.60	2.4255	25 54 18.3	3.851	4	9 28 3.97	2.1167	20 22 42.4	9.469
5	7 41 15.97	2.4202	25 50 22.8	3.998	5	9 30 10.78	2.1103	20 13 11.7	9.554
6	7 43 41.02	2.4147	25 46 18.5	4.144	6	9 32 17.21	2.1039	20 3 35.9	9.638
7	7 46 5.73	2.4090	25 42 5.5	4.287	7	9 34 23.25	2.0974	19 53 55.1	9.722
8	7 48 30.10	2.4032	25 37 44.0	4.430	8	9 36 28.90	2.0909	19 44 9.3	9.804
9	7 50 54.12	2.3975	25 33 13.9	4.572	9	9 38 34.16	2.0845	19 34 18.6	9.885
10	7 53 17.80	2.3917	25 28 35.3	4.713	10	9 40 39.04	2.0782	19 24 23.1	9.964
11	7 55 41.12	2.3858	25 23 48.3	4.853	11	9 42 43.55	2.0720	19 14 22.9	10.042
12	7 58 4.09	2.3798	25 18 52.9	4.992	12	9 44 47.68	2.0657	19 4 18.1	10.119
13	8 0 26.70	2.3738	25 13 49.3	5.129	13	9 46 51.43	2.0594	18 54 8.7	10.195
14	8 2 48.94	2.3677	25 8 37.5	5.265	14	9 48 54.81	2.0533	18 43 54.7	10.270
15	8 5 10.82	2.3616	25 3 17.5	5.400	15	9 50 57.83	2.0472	18 33 36.3	10.343
16	8 7 32.33	2.3554	24 57 49.5	5.533	16	9 53 0.48	2.0412	18 23 13.5	10.416
17	8 9 53.46	2.3491	24 52 13.6	5.665	17	9 55 2.77	2.0352	18 12 46.4	10.487
18	8 12 14.22	2.3428	24 46 29.7	5.797	18	9 57 4.70	2.0292	18 2 15.1	10.557
19	8 14 34.60	2.3364	24 40 38.0	5.926	19	9 59 6.27	2.0232	17 51 39.6	10.626
20	8 16 54.59	2.3300	24 34 38.6	6.053	20	10 1 7.49	2.0173	17 41 0.0	10.694
21	8 19 14.20	2.3237	24 28 31.6	6.180	21	10 3 8.35	2.0114	17 30 16.3	10.762
22	8 21 33.43	2.3172	24 22 17.0	6.307	22	10 5 8.86	2.0057	17 19 28.6	10.828
23	8 23 52.26	2.3106	N.24 15 54.8	6.432	23	10 7 9.03	2.0000	N.17 8 37.0	10.892
FRIDAY 18.					**SUNDAY 20.**				
0	8 26 10.70	2.3041	N.24 9 25.2	6.554	0	10 9 8.86	1.9943	N.16 57 41.6	10.955
1	8 28 28.75	2.2975	24 2 48.3	6.676	1	10 11 8.35	1.9887	16 46 42.4	11.017
2	8 30 46.40	2.2908	23 56 4.1	6.797	2	10 13 7.51	1.9831	16 35 39.5	11.079
3	8 33 3.65	2.2842	23 49 12.7	6.916	3	10 15 6.33	1.9776	16 24 32.9	11.140
4	8 35 20.50	2.2775	23 42 14.2	7.033	4	10 17 4.82	1.9722	16 13 22.7	11.199
5	8 37 36.95	2.2709	23 35 8.7	7.150	5	10 19 2.99	1.9668	16 2 9.0	11.257
6	8 39 53.01	2.2642	23 27 56.2	7.265	6	10 21 0.84	1.9615	15 50 51.8	11.315
7	8 42 8.66	2.2575	23 20 36.9	7.378	7	10 22 58.37	1.9562	15 39 31.2	11.371
8	8 44 23.91	2.2507	23 13 10.8	7.491	8	10 24 55.59	1.9510	15 28 7.3	11.426
9	8 46 38.75	2.2440	23 5 37.9	7.603	9	10 26 52.49	1.9458	15 16 40.1	11.481
10	8 48 53.19	2.2372	22 57 58.4	7.713	10	10 28 49.09	1.9407	15 5 9.6	11.535
11	8 51 7.22	2.2304	22 50 12.3	7.822	11	10 30 45.38	1.9357	14 53 35.9	11.587
12	8 53 20.84	2.2237	22 42 19.8	7.928	12	10 32 41.37	1.9308	14 41 59.1	11.638
13	8 55 34.06	2.2169	22 34 20.9	8.034	13	10 34 37.07	1.9259	14 30 19.3	11.688
14	8 57 46.87	2.2102	22 26 15.7	8.139	14	10 36 32.48	1.9210	14 18 36.5	11.738
15	8 59 59.28	2.2034	22 18 4.2	8.242	15	10 38 27.59	1.9162	14 6 50.7	11.787
16	9 2 11.28	2.1967	22 9 46.6	8.344	16	10 40 22.42	1.9116	13 55 2.0	11.835
17	9 4 22.88	2.1900	22 1 22.9	8.446	17	10 42 16.98	1.9070	13 43 10.5	11.881
18	9 6 34.08	2.1832	21 52 53.1	8.546	18	10 44 11.26	1.9024	13 31 16.3	11.927
19	9 8 44.87	2.1765	21 44 17.4	8.643	19	10 46 5.26	1.8978	13 19 19.3	11.972
20	9 10 55.26	2.1698	21 35 35.9	8.740	20	10 47 59.00	1.8935	13 7 19.6	12.017
21	9 13 5.25	2.1631	21 26 48.6	8.836	21	10 49 52.48	1.8892	12 55 17.3	12.060
22	9 15 14.83	2.1564	21 17 55.6	8.930	22	10 51 45.70	1.8849	12 43 12.4	12.102
23	9 17 24.01	2.1498	21 8 57.0	9.022	23	10 53 38.66	1.8806	12 31 5.0	12.143
24	9 19 32.80	2.1432	N.20 59 52.9	9.114	24	10 55 31.37	1.8764	N.12 18 55.2	12.183

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 21.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 55 31.37	1.8764	N. 12 18 55.2	12.183
1	10 57 23.83	1.8723	12 6 43.0	12.223
2	10 59 16.05	1.8683	11 54 28.4	12.263
3	11 1 8.03	1.8643	11 42 11.4	12.302
4	11 2 59.77	1.8604	11 29 52.2	12.339
5	11 4 51.28	1.8567	11 17 30.8	12.375
6	11 6 42.57	1.8530	11 5 7.2	12.411
7	11 8 33.64	1.8493	10 52 41.5	12.446
8	11 10 24.49	1.8457	10 40 13.7	12.479
9	11 12 15.12	1.8421	10 27 44.0	12.512
10	11 14 5.54	1.8387	10 15 12.3	12.545
11	11 15 55.76	1.8354	10 2 38.6	12.577
12	11 17 45.79	1.8322	9 50 3.0	12.608
13	11 19 35.62	1.8289	9 37 25.6	12.638
14	11 21 25.26	1.8257	9 24 46.4	12.667
15	11 23 14.70	1.8225	9 12 5.5	12.696
16	11 25 3.96	1.8196	8 59 22.9	12.724
17	11 26 53.05	1.8167	8 46 38.6	12.752
18	11 28 41.96	1.8138	8 33 52.6	12.779
19	11 30 30.70	1.8110	8 21 5.1	12.804
20	11 32 19.28	1.8082	8 8 16.1	12.829
21	11 34 7.69	1.8056	7 55 25.6	12.853
22	11 35 55.95	1.8031	7 42 33.7	12.877
23	11 37 44.06	1.8006	N. 7 29 40.4	12.900

TUESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 39 32.02	1.7982	N. 7 16 45.7	12.922
1	11 41 19.84	1.7958	7 3 49.7	12.944
2	11 43 7.52	1.7935	6 50 52.4	12.965
3	11 44 55.06	1.7913	6 37 53.9	12.985
4	11 46 42.47	1.7892	6 24 54.2	13.004
5	11 48 29.76	1.7872	6 11 53.4	13.023
6	11 50 16.93	1.7852	5 58 51.4	13.042
7	11 52 3.99	1.7833	5 45 48.3	13.059
8	11 53 50.93	1.7814	5 32 44.3	13.075
9	11 55 37.76	1.7797	5 19 39.3	13.092
10	11 57 24.49	1.7781	5 6 33.3	13.108
11	11 59 11.13	1.7765	4 53 26.4	13.123
12	12 0 57.67	1.7749	4 40 18.5	13.138
13	12 2 44.12	1.7735	4 27 9.8	13.151
14	12 4 30.49	1.7721	4 14 0.4	13.164
15	12 6 16.78	1.7708	4 0 50.2	13.176
16	12 8 2.99	1.7696	3 47 39.3	13.188
17	12 9 49.13	1.7684	3 34 27.7	13.199
18	12 11 35.20	1.7673	3 21 15.4	13.210
19	12 13 21.21	1.7663	3 8 2.5	13.219
20	12 15 7.16	1.7654	2 54 49.1	13.228
21	12 16 53.06	1.7646	2 41 35.1	13.237
22	12 18 38.91	1.7638	2 28 20.6	13.246
23	12 20 24.72	1.7631	2 15 5.6	13.253
24	12 22 10.49	1.7625	N. 2 1 50.2	13.260

WEDNESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 22 10.49	1.7625	N. 2 1 50.2	13.260
1	12 23 56.22	1.7620	1 48 34.4	13.266
2	12 25 41.93	1.7616	1 35 18.3	13.271
3	12 27 27.61	1.7612	1 22 1.9	13.276
4	12 29 13.27	1.7608	1 8 45.2	13.280
5	12 30 58.91	1.7605	0 55 28.3	13.284
6	12 32 44.53	1.7604	0 42 11.1	13.287
7	12 34 30.15	1.7603	0 28 53.8	13.289
8	12 36 15.77	1.7602	0 15 36.4	13.291
9	12 38 1.38	1.7602	N. 0 2 18.9	13.292
10	12 39 47.00	1.7604	S. 0 10 58.7	13.293
11	12 41 32.63	1.7607	0 24 16.3	13.292
12	12 43 18.28	1.7610	0 37 33.8	13.292
13	12 45 3.95	1.7613	0 50 51.3	13.291
14	12 46 49.64	1.7617	1 4 8.7	13.289
15	12 48 35.36	1.7622	1 17 26.0	13.287
16	12 50 21.11	1.7628	1 30 43.1	13.283
17	12 52 6.90	1.7635	1 44 0.0	13.279
18	12 53 52.73	1.7642	1 57 16.6	13.274
19	12 55 38.60	1.7650	2 10 32.9	13.269
20	12 57 24.53	1.7659	2 23 48.9	13.264
21	12 59 10.51	1.7668	2 37 4.6	13.258
22	13 0 56.55	1.7679	2 50 19.9	13.251
23	13 2 42.66	1.7690	S. 3 3 34.7	13.244

THURSDAY 24.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	13 4 28.83	1.7701	S. 3 16 49.1	13.236
1	13 6 15.07	1.7713	3 30 3.0	13.227
2	13 8 1.39	1.7727	3 43 16.3	13.217
3	13 9 47.80	1.7742	3 56 29.0	13.207
4	13 11 34.29	1.7757	4 9 41.1	13.196
5	13 13 20.88	1.7772	4 22 52.5	13.184
6	13 15 7.56	1.7788	4 36 3.2	13.172
7	13 16 54.34	1.7806	4 49 13.2	13.160
8	13 18 41.23	1.7824	5 2 22.4	13.147
9	13 20 28.22	1.7842	5 15 30.8	13.133
10	13 22 15.33	1.7861	5 28 38.3	13.118
11	13 24 2.56	1.7881	5 41 44.9	13.102
12	13 25 49.90	1.7901	5 54 50.5	13.085
13	13 27 37.37	1.7923	6 7 55.1	13.068
14	13 29 24.98	1.7946	6 20 58.7	13.051
15	13 31 12.72	1.7968	6 34 1.3	13.034
16	13 33 0.60	1.7992	6 47 2.8	13.015
17	13 34 48.63	1.8017	7 0 3.1	12.994
18	13 36 36.80	1.8042	7 13 2.1	12.973
19	13 38 25.13	1.8068	7 25 59.9	12.953
20	13 40 13.62	1.8094	7 38 56.4	12.932
21	13 42 2.26	1.8121	7 51 51.7	12.910
22	13 43 51.07	1.8149	8 4 45.6	12.888
23	13 45 40.05	1.8178	8 17 38.0	12.863
24	13 47 29.21	1.8208	S. 8 30 29.0	12.837

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 47 29.21	1.8208	S. 8 30 29.0	12.837	0	15 19 35.99	2.0415	S. 18 2 4.3	10.615
1	13 49 18.55	1.8238	8 43 18.5	12.812	1	15 21 38.66	2.0475	18 12 39.1	10.544
2	13 51 8.07	1.8269	8 56 6.4	12.785	2	15 23 41.69	2.0536	18 23 9.6	10.472
3	13 52 57.78	1.8301	9 8 52.7	12.758	3	15 25 45.09	2.0597	18 33 35.7	10.398
4	13 54 47.68	1.8333	9 21 37.4	12.730	4	15 27 48.85	2.0658	18 43 57.3	10.322
5	13 56 37.78	1.8366	9 34 20.3	12.701	5	15 29 52.98	2.0719	18 54 14.3	10.245
6	13 58 28.08	1.8400	9 47 1.5	12.672	6	15 31 57.48	2.0782	19 4 26.7	10.168
7	14 0 18.58	1.8435	9 59 41.0	12.642	7	15 34 2.36	2.0844	19 14 34.5	10.090
8	14 2 9.30	1.8471	10 12 18.6	12.611	8	15 36 7.61	2.0907	19 24 37.5	10.010
9	14 4 0.23	1.8507	10 24 54.3	12.579	9	15 38 13.24	2.0970	19 34 35.7	9.929
10	14 5 51.38	1.8543	10 37 28.1	12.547	10	15 40 19.25	2.1033	19 44 29.0	9.847
11	14 7 42.75	1.8580	10 49 59.9	12.513	11	15 42 25.64	2.1097	19 54 17.4	9.764
12	14 9 34.34	1.8618	11 2 29.6	12.478	12	15 44 32.41	2.1161	20 4 0.7	9.679
13	14 11 26.17	1.8657	11 14 57.2	12.443	13	15 46 39.57	2.1226	20 13 38.9	9.593
14	14 13 18.23	1.8697	11 27 22.8	12.408	14	15 48 47.12	2.1290	20 23 11.9	9.507
15	14 15 10.53	1.8737	11 39 46.2	12.371	15	15 50 55.05	2.1354	20 32 39.7	9.418
16	14 17 3.08	1.8778	11 52 7.3	12.333	16	15 53 3.37	2.1419	20 42 2.1	9.328
17	14 18 55.87	1.8819	12 4 26.1	12.294	17	15 55 12.08	2.1485	20 51 19.1	9.237
18	14 20 48.91	1.8862	12 16 42.6	12.255	18	15 57 21.19	2.1551	21 0 30.5	9.144
19	14 22 42.21	1.8905	12 28 56.7	12.214	19	15 59 30.69	2.1616	21 9 36.4	9.051
20	14 24 35.77	1.8948	12 41 8.3	12.173	20	16 1 40.58	2.1682	21 18 36.7	8.957
21	14 26 29.59	1.8992	12 53 17.5	12.131	21	16 3 50.87	2.1747	21 27 31.2	8.860
22	14 28 23.67	1.9037	13 5 24.1	12.087	22	16 6 1.55	2.1813	21 36 19.9	8.762
23	14 30 18.03	1.9083	S. 13 17 28.0	12.043	23	16 8 12.63	2.1879	S. 21 45 2.7	8.664
	SATURDAY 26.					MONDAY 28.			
0	14 32 12.67	1.9130	S. 13 29 29.3	11.999	0	16 10 24.10	2.1945	S. 21 53 39.6	8.564
1	14 34 7.59	1.9177	13 41 27.9	11.953	1	16 12 35.97	2.2011	22 2 10.4	8.462
2	14 36 2.79	1.9224	13 53 23.7	11.906	2	16 14 48.24	2.2077	22 10 35.1	8.360
3	14 37 58.27	1.9271	14 5 16.6	11.858	3	16 17 0.90	2.2143	22 18 53.6	8.256
4	14 39 54.04	1.9320	14 17 6.6	11.809	4	16 19 13.96	2.2209	22 27 5.8	8.151
5	14 41 50.11	1.9370	14 28 53.7	11.760	5	16 21 27.41	2.2275	22 35 11.7	8.044
6	14 43 46.48	1.9420	14 40 37.8	11.709	6	16 23 41.26	2.2341	22 43 11.1	7.936
7	14 45 43.15	1.9471	14 52 18.8	11.657	7	16 25 55.51	2.2407	22 51 4.0	7.827
8	14 47 40.13	1.9522	15 3 56.7	11.604	8	16 28 10.15	2.2472	22 58 50.3	7.716
9	14 49 37.41	1.9573	15 15 31.3	11.550	9	16 30 25.18	2.2538	23 6 29.9	7.604
10	14 51 35.00	1.9625	15 27 2.7	11.496	10	16 32 40.61	2.2604	23 14 2.8	7.492
11	14 53 32.91	1.9678	15 38 30.8	11.440	11	16 34 56.43	2.2669	23 21 28.9	7.377
12	14 55 31.14	1.9732	15 49 55.5	11.383	12	16 37 12.64	2.2734	23 28 48.0	7.260
13	14 57 29.69	1.9786	16 1 16.7	11.325	13	16 39 29.24	2.2799	23 36 0.1	7.143
14	14 59 28.57	1.9841	16 12 34.5	11.267	14	16 41 46.23	2.2863	23 43 5.2	7.025
15	15 1 27.78	1.9896	16 23 48.7	11.206	15	16 44 3.60	2.2927	23 50 3.1	6.905
16	15 3 27.32	1.9952	16 34 59.2	11.144	16	16 46 21.35	2.2991	23 56 53.8	6.784
17	15 5 27.20	2.0008	16 46 6.0	11.082	17	16 48 39.49	2.3055	24 3 37.2	6.662
18	15 7 27.41	2.0064	16 57 9.0	11.018	18	16 50 58.01	2.3118	24 10 13.2	6.538
19	15 9 27.97	2.0131	17 8 8.2	10.954	19	16 53 16.90	2.3180	24 16 41.7	6.413
20	15 11 28.87	2.0179	17 19 3.5	10.888	20	16 55 36.17	2.3243	24 23 2.7	6.287
21	15 13 30.12	2.0238	17 29 54.8	10.822	21	16 57 55.82	2.3306	24 29 16.1	6.159
22	15 15 31.72	2.0297	17 40 42.1	10.754	22	17 0 15.84	2.3367	24 35 21.8	6.031
23	15 17 33.68	2.0356	17 51 25.3	10.685	23	17 2 36.22	2.3427	24 41 19.8	5.901
24	15 19 35.99	2.0415	S. 18 2 4.3	10.615	24	17 4 56.97	2.3488	S. 24 47 9.9	5.769

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	17 4 56.97	2.3488	S.24 47 9.9	5.769
1	17 7 18.08	2.3548	24 52 52.1	5.637
2	17 9 39.55	2.3607	24 58 26.3	5.503
3	17 12 1.37	2.3666	25 3 52.4	5.368
4	17 14 23.54	2.3724	25 9 10.4	5.232
5	17 16 46.05	2.3781	25 14 20.2	5.094
6	17 19 8.91	2.3838	25 19 21.7	4.956
7	17 21 32.11	2.3894	25 24 14.9	4.816
8	17 23 55.64	2.3948	25 28 59.6	4.674
9	17 26 19.49	2.4002	25 33 35.8	4.532
10	17 28 43.67	2.4056	25 38 3.5	4.390
11	17 31 8.17	2.4110	25 42 22.6	4.245
12	17 33 32.99	2.4162	25 46 32.9	4.099
13	17 35 58.12	2.4213	25 50 34.5	3.953
14	17 38 23.55	2.4263	25 54 27.3	3.807
15	17 40 49.27	2.4312	25 58 11.3	3.658
16	17 43 15.29	2.4361	26 1 46.3	3.508
17	17 45 41.60	2.4408	26 5 12.2	3.357
18	17 48 8.19	2.4454	26 8 29.1	3.206
19	17 50 35.05	2.4499	26 11 36.9	3.053
20	17 53 2.18	2.4544	26 14 35.5	2.899
21	17 55 29.58	2.4587	26 17 24.8	2.744
22	17 57 57.23	2.4629	26 20 4.8	2.589
23	18 0 25.13	2.4671	S.26 22 35.5	2.434

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	18 2 53.28	2.4711	S.26 24 56.9	2.277
1	18 5 21.66	2.4749	26 27 8.8	2.119
2	18 7 50.27	2.4787	26 29 11.2	1.960
3	18 10 19.10	2.4823	26 31 4.0	1.800
4	18 12 48.15	2.4858	26 32 47.2	1.640
5	18 15 17.40	2.4892	26 34 20.8	1.480
6	18 17 46.85	2.4925	26 35 44.8	1.318
7	18 20 16.50	2.4957	26 36 59.0	1.156
8	18 22 46.33	2.4987	26 38 3.5	0.993
9	18 25 16.34	2.5016	26 38 58.2	0.830
10	18 27 46.52	2.5043	26 39 43.1	0.666
11	18 30 16.86	2.5069	26 40 18.1	0.501
12	18 32 47.35	2.5094	26 40 43.2	0.336
13	18 35 17.99	2.5118	26 40 58.4	0.170
14	18 37 48.77	2.5141	26 41 3.6	− 0.004
15	18 40 19.68	2.5162	26 40 58.9	+ 0.162
16	18 42 50.71	2.5181	26 40 44.2	0.329
17	18 45 21.85	2.5199	26 40 19.4	0.497
18	18 47 53.10	2.5217	26 39 44.5	0.665
19	18 50 24.45	2.5232	26 38 59.6	0.833
20	18 52 55.89	2.5246	26 38 4.6	1.001
21	18 55 27.40	2.5258	26 36 59.5	1.169
22	18 57 58.98	2.5269	26 35 44.3	1.338
23	19 0 30.63	2.5280	26 34 19.0	1.507
24	19 3 2.34	2.5288	S.26 32 43.5	1.676

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 3 2.34	2.5288	S.26 32 43.5	1.676
1	19 5 34.09	2.5295	26 30 57.9	1.845
2	19 8 5.88	2.5301	26 29 2.1	2.014
3	19 10 37.70	2.5305	26 26 56.2	2.183
4	19 13 9.54	2.5308	26 24 40.1	2.352
5	19 15 41.40	2.5310	26 22 13.9	2.521
6	19 18 13.26	2.5309	26 19 37.6	2.690
7	19 20 45.11	2.5308	26 16 51.1	2.859
8	19 23 16.96	2.5306	26 13 54.5	3.027
9	19 25 48.79	2.5302	26 10 47.8	3.196
10	19 28 20.59	2.5297	26 7 31.0	3.365
11	19 30 52.36	2.5291	26 4 4.0	3.534
12	19 33 24.08	2.5282	26 0 26.9	3.702
13	19 35 55.75	2.5273	25 56 39.8	3.869
14	19 38 27.36	2.5262	25 52 42.6	4.036
15	19 40 58.90	2.5251	25 48 35.4	4.203
16	19 43 30.37	2.5238	25 44 18.2	4.370
17	19 46 1.75	2.5223	25 39 51.0	4.536
18	19 48 33.04	2.5206	25 35 13.9	4.701
19	19 51 4.23	2.5189	25 30 26.9	4.867
20	19 53 35.31	2.5172	25 25 29.9	5.032
21	19 56 6.29	2.5153	25 20 23.0	5.196
22	19 58 37.15	2.5132	25 15 6.3	5.359
23	20 1 7.88	2.5110	S.25 9 39.9	5.522

FRIDAY, JANUARY 1, 1892.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 3 38.47	2.5087	S.25 4 3.7	5.684

PHASES OF THE MOON.

		d	h	m
☽ First Quarter . .	Dec.	8	5	13.2
○ Full Moon		15	0	52.6
☾ Last Quarter		22	17	38.6
● New Moon		30	15	19.8

		d	h
☾ Perigee	Dec.	11	6.1
☾ Apogee		23	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
2	Sun	W.	12° 7′ 25″	3044	13° 36′ 43″	3030	15° 6′ 18″	3018	16° 36′ 8″	3006
	Fomalhaut	E.	70 52 40	2866	69 19 37	2861	67 46 28	2856	66 13 13	2852
	α Pegasi	E.	90 46 19	3071	89 17 34	3061	87 48 37	3053	86 19 30	3046
3	Sun	W.	24 8 44	2955	25 39 53	2945	27 11 15	2936	28 42 48	2927
	Fomalhaut	E.	58 26 1	2844	56 52 30	2845	55 19 0	2847	53 45 33	2850
	α Pegasi	E.	78 51 56	3019	77 22 7	3017	75 52 15	3014	74 22 20	3014
4	Sun	W.	36 23 25	2883	37 56 5	2875	39 28 56	2867	41 1 57	2859
	Fomalhaut	E.	45 59 55	2889	44 27 22	2903	42 55 7	2920	41 23 13	2939
	α Pegasi	E.	66 52 49	3023	65 23 5	3028	63 53 27	3035	62 23 58	3044
5	Sun	W.	48 49 40	2819	50 23 43	2811	51 57 56	2805	53 32 18	2797
	α Pegasi	E.	54 59 56	3115	53 32 5	3137	52 4 40	3161	50 37 44	3189
	α Arietis	E.	95 8 43	2572	93 29 10	2565	91 49 27	2558	90 9 34	2551
6	Sun	W.	61 26 34	2760	63 1 54	2753	64 37 23	2747	66 13 1	2740
	α Arietis	E.	81 47 53	2520	80 7 7	2515	78 26 14	2509	76 45 13	2504
	Aldebaran	E.	112 6 19	2459	110 24 8	2452	108 41 47	2444	106 59 15	2438
7	Sun	W.	74 13 29	2705	75 50 2	2698	77 26 44	2692	79 3 34	2686
	α Aquilæ	W.	44 24 42	4517	45 28 19	4383	46 33 56	4260	47 41 26	4150
	α Arietis	E.	68 18 29	2482	66 36 51	2479	64 55 8	2476	63 13 21	2474
	Aldebaran	E.	98 24 11	2404	96 40 42	2398	94 57 4	2391	93 13 17	2385
8	Sun	W.	87 9 55	2654	88 47 37	2648	90 25 27	2642	92 3 25	2636
	α Aquilæ	W.	53 42 57	3722	54 59 21	3656	56 16 55	3596	57 35 31	3541
	α Arietis	E.	54 43 47	2468	53 1 49	2470	51 19 53	2472	49 38 0	2474
	Aldebaran	E.	84 32 10	2356	82 47 32	2350	81 2 45	2345	79 17 51	2339
9	Sun	W.	100 15 12	2608	101 53 56	2603	103 32 47	2598	105 11 45	2593
	α Aquilæ	W.	64 22 35	3324	65 46 19	3289	67 10 43	3259	68 35 43	3231
	Fomalhaut	W.	29 31 8	3044	31 0 26	2965	32 31 22	2897	34 3 45	2837
	Jupiter	W.	17 27 47	2417	19 10 58	2397	20 54 37	2380	22 38 40	2366
	α Arietis	E.	41 10 6	2509	39 29 5	2521	37 48 21	2537	36 7 59	2556
	Aldebaran	E.	70 31 32	2316	68 45 56	2312	67 0 14	2309	65 14 27	2304
	Pollux	E.	114 35 25	2288	112 49 8	2283	111 2 43	2278	109 16 11	2274
10	Sun	W.	113 28 8	2573	115 7 42	2569	116 47 20	2565	118 27 3	2562
	α Aquilæ	W.	75 48 14	3121	77 15 58	3105	78 44 1	3091	80 12 21	3079
	Fomalhaut	W.	42 2 6	2633	43 40 16	2606	45 19 3	2581	46 58 24	2559
	Jupiter	W.	31 23 6	2320	33 8 37	2313	34 54 17	2307	36 40 6	2302
	Aldebaran	E.	56 24 18	2291	54 38 6	2289	52 51 51	2288	51 5 34	2286
	Pollux	E.	100 21 55	2253	98 34 46	2249	96 47 32	2246	95 0 13	2243
11	Sun	W.	126 46 34	2551	128 26 36	2550	130 6 40	2550	131 46 44	2549
	α Aquilæ	W.	87 37 4	3043	89 6 23	3042	90 35 44	3041	92 5 6	3043
	Fomalhaut	W.	55 21 51	2478	57 3 35	2467	58 45 35	2457	60 27 49	2448
	Jupiter	W.	45 30 52	2283	47 17 16	2281	49 3 43	2279	50 50 13	2278
	α Pegasi	W.	40 3 34	3308	41 27 36	3231	42 53 8	3164	44 20 0	3105
	Aldebaran	E.	42 14 16	2294	40 28 8	2298	38 42 6	2302	36 56 10	2309
	Pollux	E.	86 2 37	2232	84 14 57	2231	82 27 15	2230	80 39 32	2229

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
2	Sun	W.	18° 6′ 13″	2996	19° 36′ 31″	2985	21° 7′ 3″	2975	22° 37′ 47″	2965
	Fomalhaut	E.	64 39 53	2849	63 6 29	2847	61 33 2	2845	59 59 32	2844
	α Pegasi	E.	84 50 14	3039	83 20 50	3033	81 51 18	3028	80 21 40	3023
3	Sun	W.	30 14 33	2918	31 46 29	2909	33 18 37	2900	34 50 56	2892
	Fomalhaut	E.	52 12 10	2855	50 38 53	2860	49 5 43	2868	47 32 43	2877
	α Pegasi	E.	72 52 24	3014	71 22 28	3014	69 52 32	3016	68 22 39	3018
4	Sun	W.	42 35 9	2851	44 8 31	2842	45 42 4	2835	47 15 47	2827
	Fomalhaut	E.	39 51 44	2963	38 20 45	2990	36 50 20	3024	35 20 37	3063
	α Pegasi	E.	60 54 40	3055	59 25 35	3066	57 56 44	3080	56 28 10	3096
5	Sun	W.	55 6 50	2789	56 41 32	2782	58 16 23	2775	59 51 24	2768
	α Pegasi	E.	49 11 22	3221	47 45 38	3258	46 20 37	3299	44 56 24	3345
	α Arietis	E.	88 29 32	2544	86 49 20	2538	85 9 0	2532	83 28 31	2525
6	Sun	W.	67 48 48	2733	69 24 44	2725	71 0 50	2719	72 37 5	2712
	α Arietis	E.	75 4 5	2499	73 22 50	2494	71 41 29	2490	70 0 2	2486
	Aldebaran	E.	105 16 34	2431	103 33 43	2424	101 50 42	2417	100 7 31	2410
7	Sun	W.	80 40 33	2679	82 17 41	2673	83 54 57	2666	85 32 22	2660
	α Aquilæ	W.	48 50 40	4047	50 1 33	3955	51 13 57	3870	52 27 47	3792
	α Arietis	E.	61 31 31	2472	59 49 38	2470	58 7 42	2469	56 25 45	2468
	Aldebaran	E.	91 29 21	2379	89 45 16	2373	88 1 2	2367	86 16 40	2362
8	Sun	W.	93 41 31	2630	95 19 45	2625	96 58 6	2619	98 36 35	2613
	α Aquilæ	W.	58 55 13	3490	60 15 48	3443	61 37 16	3400	62 59 33	3360
	α Arietis	E.	47 56 10	2478	46 14 26	2483	44 32 49	2490	42 51 22	2498
	Aldebaran	E.	77 32 49	2335	75 47 40	2330	74 2 24	2325	72 17 1	2321
9	Sun	W.	106 50 49	2588	108 30 0	2584	110 9 17	2580	111 48 40	2576
	α Aquilæ	W.	70 1 16	3204	71 27 20	3180	72 53 53	3158	74 20 52	3139
	Fomalhaut	W.	35 37 25	2785	37 12 12	2740	38 47 59	2700	40 24 39	2665
	Jupiter	W.	24 23 3	2355	26 7 43	2344	27 52 38	2335	29 37 46	2327
	α Arietis	E.	34 28 3	2579	32 48 39	2606	31 9 52	2640	29 31 51	2679
	Aldebaran	E.	63 28 34	2301	61 42 36	2298	59 56 34	2296	58 10 28	2293
	Pollux	E.	107 29 33	2269	105 42 48	2264	103 55 56	2260	102 8 58	2257
10	Sun	W.	120 6 50	2559	121 46 41	2556	123 26 36	2554	125 6 34	2553
	α Aquilæ	W.	81 40 56	3069	83 9 44	3060	84 38 43	3053	86 7 50	3047
	Fomalhaut	W.	48 38 16	2539	50 18 35	2521	51 59 19	2505	53 40 25	2491
	Jupiter	W.	38 26 3	2297	40 12 7	2293	41 58 17	2289	43 44 32	2286
	Aldebaran	E.	49 19 17	2288	47 33 0	2288	45 46 43	2289	44 0 28	2291
	Pollux	E.	93 12 49	2240	91 25 21	2238	89 37 50	2235	87 50 15	2233
11	Sun	W.	133 26 49	2549	135 6 54	2550	136 46 58	2551	138 27 1	2552
	α Aquilæ	W.	93 34 26	3045	95 3 43	3050	96 32 54	3056	98 1 58	3064
	Fomalhaut	W.	62 10 15	2441	63 52 52	2434	65 35 38	2429	67 18 32	2424
	Jupiter	W.	52 36 45	2277	54 23 18	2277	56 9 52	2276	57 56 27	2277
	α Pegasi	W.	45 48 3	3052	47 17 11	3005	48 47 17	2964	50 18 15	2927
	Aldebaran	E.	35 10 23	2315	33 24 46	2325	31 39 23	2336	29 54 16	2350
	Pollux	E.	78 51 47	2229	77 4 2	2229	75 16 17	2229	73 28 33	2230

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
12	α Aquilæ	W.	99° 30′ 52″	3074	100° 59′ 33″	3086	102° 28′ 0″	3100	103° 56′ 10″	3115
	Fomalhaut	W.	69 1 33	2420	70 44 39	2418	72 27 48	2416	74 11 0	2415
	JUPITER	W.	59 43 1	2277	61 29 34	2278	63 16 6	2280	65 2 35	2283
	α Pegasi	W.	51 50 0	2894	53 22 26	2865	54 55 30	2839	56 29 7	2817
	Pollux	E.	71 40 50	2231	69 53 9	2233	68 5 30	2235	66 17 54	2237
	Regulus	E.	107 58 28	2244	106 11 6	2245	104 23 45	2247	102 36 27	2248
13	Fomalhaut	W.	82 46 57	2422	84 30 0	2426	86 12 57	2431	87 55 48	2436
	JUPITER	W.	73 54 0	2299	75 40 1	2304	77 25 55	2309	79 11 41	2315
	α Pegasi	W.	64 23 23	2741	65 59 8	2733	67 35 4	2726	69 11 9	2721
	α Arietis	W.	20 59 23	3026	22 29 3	2924	24 0 52	2849	25 34 25	2776
	Pollux	E.	57 21 2	2256	55 33 57	2261	53 47 0	2266	52 0 11	2272
	Regulus	E.	93 40 53	2266	91 54 3	2270	90 7 20	2275	88 20 44	2281
14	Fomalhaut	W.	96 27 50	2474	98 9 40	2483	99 51 17	2494	101 32 39	2506
	JUPITER	W.	87 58 14	2350	89 43 0	2358	91 27 35	2367	93 11 57	2376
	α Pegasi	W.	77 12 40	2716	78 48 58	2719	80 25 12	2724	82 1 20	2730
	α Arietis	W.	33 38 54	2599	35 17 50	2583	36 57 8	2570	38 36 44	2561
	Pollux	E.	43 8 29	2309	41 22 43	2317	39 37 9	2327	37 51 49	2337
	Regulus	E.	79 30 6	2316	77 44 30	2325	75 59 7	2334	74 13 57	2343
15	JUPITER	W.	101 50 15	2429	103 33 9	2441	105 15 46	2453	106 58 6	2465
	α Pegasi	W.	89 59 40	2773	91 34 43	2785	93 9 30	2798	94 44 0	2812
	α Arietis	W.	46 56 55	2547	48 37 3	2550	50 17 7	2553	51 57 6	2558
	Pollux	E.	29 8 58	2394	27 25 14	2408	25 41 50	2422	23 58 46	2437
	Regulus	E.	65 31 40	2396	63 48 0	2406	62 4 36	2420	60 21 30	2433
	Spica	E.	119 34 32	2398	117 50 55	2410	116 7 34	2420	114 24 28	2432
16	JUPITER	W.	115 25 17	2531	117 5 47	2545	118 45 57	2560	120 25 47	2574
	α Pegasi	W.	102 31 35	2896	104 3 59	2916	105 35 57	2937	107 7 29	2959
	α Arietis	W.	60 14 55	2596	61 53 55	2606	63 32 42	2617	65 11 14	2627
	Aldebaran	W.	29 34 29	2590	31 13 38	2593	32 52 42	2599	34 31 39	2604
	Regulus	E.	51 50 39	2502	50 9 28	2516	48 28 37	2531	46 48 7	2547
	Spica	E.	105 53 12	2494	104 11 50	2507	102 30 47	2521	100 50 3	2535
17	α Arietis	W.	73 20 2	2689	74 56 57	2702	76 33 34	2715	78 9 54	2729
	Aldebaran	W.	42 43 49	2651	44 21 35	2662	45 59 6	2674	47 36 21	2687
	Regulus	E.	38 31 11	2630	36 52 57	2649	35 15 8	2667	33 37 44	2686
	Spica	E.	92 31 13	2606	90 52 26	2621	89 14 0	2636	87 35 54	2651
18	α Arietis	W.	86 6 53	2801	87 41 20	2815	89 15 29	2829	90 49 19	2845
	Aldebaran	W.	55 38 23	2750	57 13 56	2764	58 49 11	2777	60 24 9	2791
	Spica	E.	79 30 26	2726	77 54 21	2741	76 18 35	2756	74 43 9	2771
19	α Arietis	W.	98 33 43	2917	100 5 40	2931	101 37 19	2946	103 8 40	2960
	Aldebaran	W.	68 14 36	2857	69 47 50	2869	71 20 48	2882	72 53 30	2895
	Pollux	W.	23 59 20	2845	25 32 50	2856	27 6 5	2868	28 39 5	2879
	Spica	E.	66 50 48	2843	65 17 16	2857	63 44 2	2871	62 11 6	2884
	SUN	E.	131 20 34	3199	129 54 24	3214	128 28 31	3227	127 2 54	3241
20	Aldebaran	W.	80 33 3	2954	82 4 13	2965	83 35 10	2976	85 5 53	2985
	Pollux	W.	36 20 30	2935	37 52 5	2946	39 23 26	2955	40 54 35	2965

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
12	α Aquilæ	W.	105° 24′ 1″	3133	106° 51′ 30″	3154	108° 18′ 34″	3177	109° 45′ 11″	3203
	Fomalhaut	W.	75 54 13	2415	77 37 26	2415	79 20 39	2417	81 3 50	2419
	JUPITER	W.	66 49 0	2285	68 35 22	2287	70 21 40	2291	72 7 53	2295
	α Pegasi	W.	58 3 13	2797	59 37 45	2780	61 12 39	2765	62 47 53	2753
	Pollux	E.	64 30 22	2940	62 42 54	2943	60 55 31	2947	59 8 13	2951
	Regulus	E.	100 49 11	2951	99 1 59	2954	97 14 52	2958	95 27 50	2961
13	Fomalhaut	W.	89 38 32	2442	91 21 7	2449	93 3 32	2456	94 45 47	2465
	JUPITER	W.	80 57 19	2321	82 42 48	2328	84 28 7	2335	86 13 16	2349
	α Pegasi	W.	70 47 21	2717	72 23 38	2715	73 59 58	2714	75 36 19	2714
	α Arietis	W.	27 9 24	2794	28 45 32	2681	30 22 37	2648	32 0 27	2621
	Pollux	E.	50 13 30	2279	48 26 59	2285	46 40 38	2293	44 54 28	2300
	Regulus	E.	86 34 17	2287	84 47 59	2294	83 1 51	2301	81 15 53	2309
14	Fomalhaut	W.	103 13 45	2517	104 54 34	2530	106 35 6	2543	108 15 19	2559
	JUPITER	W.	94 56 6	2386	96 40 1	2396	98 23 41	2407	100 7 6	2418
	α Pegasi	W.	83 37 20	2736	85 13 12	2744	86 48 53	2753	88 24 23	2763
	α Arietis	W.	40 16 33	2553	41 56 32	2549	43 36 37	2546	45 16 46	2546
	Pollux	E.	36 6 44	2347	34 21 53	2358	32 37 18	2369	30 52 59	2382
	Regulus	E.	72 29 0	2353	70 44 18	2363	68 59 50	2373	67 15 37	2384
15	JUPITER	W.	108 40 9	2477	110 21 54	2491	112 3 20	2504	113 44 28	2517
	α Pegasi	W.	96 18 12	2827	97 52 5	2843	99 25 37	2860	100 58 47	2877
	α Arietis	W.	53 36 59	2564	55 16 43	2571	56 56 18	2579	58 35 42	2587
	Pollux	E.	22 16 4	2453	20 33 45	2470	18 51 50	2489	17 10 21	2510
	Regulus	E.	58 38 42	2446	56 56 13	2459	55 14 2	2473	53 32 11	2487
	Spica	E.	112 41 39	2443	110 59 6	2455	109 16 50	2468	107 34 52	2481
16	JUPITER	W.	122 5 17	2589	123 44 27	2604	125 23 16	2620	127 1 44	2636
	α Pegasi	W.	108 38 33	2982	110 9 8	3005	111 39 14	3031	113 8 48	3057
	α Arietis	W.	66 49 32	2639	68 27 34	2651	70 5 20	2663	71 42 49	2675
	Aldebaran	W.	36 10 28	2612	37 49 7	2621	39 27 34	2630	41 5 48	2640
	Regulus	E.	45 7 59	2563	43 28 13	2579	41 48 49	2596	40 9 48	2613
	Spica	E.	99 9 38	2548	97 29 32	2563	95 49 46	2577	94 10 19	2592
17	α Arietis	W.	79 45 55	2743	81 21 38	2757	82 57 2	2772	84 32 7	2786
	Aldebaran	W.	49 13 19	2699	50 50 0	2711	52 26 25	2724	54 2 33	2738
	Regulus	E.	32 0 45	2706	30 24 13	2726	28 48 8	2748	27 12 32	2770
	Spica	E.	85 58 8	2666	84 20 42	2681	82 43 37	2696	81 6 51	2711
18	α Arietis	W.	92 22 49	2859	93 56 0	2873	95 28 53	2888	97 1 27	2902
	Aldebaran	W.	61 58 49	2804	63 33 12	2818	65 7 17	2831	66 41 5	2844
	Spica	E.	73 8 3	2785	71 33 16	2800	69 58 48	2815	68 24 30	2830
19	α Arietis	W.	104 39 43	2974	105 10 28	2988	107 40 56	3002	109 11 6	3016
	Aldebaran	W.	74 25 55	2907	75 58 5	2920	77 29 59	2931	79 1 38	2942
	Pollux	W.	30 11 51	2891	31 44 22	2901	33 16 39	2912	34 48 42	2924
	Spica	E.	60 38 27	2898	59 6 6	2911	57 34 1	2924	56 2 12	2937
	SUN	E.	125 37 33	3955	124 12 29	3968	122 47 40	3982	121 23 7	3995
20	Aldebaran	W.	86 36 24	2996	88 6 42	3005	89 36 48	3014	91 6 43	3024
	Pollux	W.	42 25 31	2975	43 56 15	2984	45 26 48	2993	46 57 9	3001

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P.L. of Diff.	IIIh.	P.L. of Diff.	VIh.	P.L. of Diff.	IXh.	P.L. of Diff.
20	Spica	E.	54° 30′ 40″	2949	52° 59′ 23″	2962	51° 28′ 22″	2973	49° 57′ 35″	2985
	Mars	E.	69 30 18	3154	68 3 14	3167	66 36 25	3178	65 9 49	3189
	Sun	E.	119 58 50	3307	118 34 47	3319	117 10 58	3331	115 47 22	3343
21	Aldebaran	W.	92 36 26	3032	94 5 59	3040	95 35 22	3048	97 4 35	3056
	Pollux	W.	48 27 20	3009	49 57 21	3018	51 27 12	3025	52 56 54	3032
	Spica	E.	42 27 15	3039	40 57 51	3050	39 28 40	3060	37 59 41	3070
	Mars	E.	57 59 58	3238	56 31 34	3246	55 9 19	3254	53 44 14	3261
	Sun	E.	108 52 31	3393	107 30 7	3401	106 7 52	3409	104 45 46	3418
22	Aldebaran	W.	104 28 37	3086	105 57 4	3090	107 25 26	3095	108 53 42	3098
	Pollux	W.	60 23 27	3059	61 52 27	3064	63 21 21	3067	64 50 11	3070
	Regulus	W.	24 25 7	3138	25 52 31	3134	27 19 59	3131	28 47 31	3128
	Spica	E.	30 37 48	3119	29 10 2	3129	27 42 28	3141	26 15 8	3153
	Mars	E.	46 40 47	3291	45 16 25	3296	43 52 9	3300	42 27 58	3304
	Antares	E.	76 18 16	3063	74 49 21	3067	73 20 31	3071	71 51 46	3074
	Sun	E.	97 57 21	3449	96 36 0	3454	95 14 44	3458	93 53 33	3462
23	Aldebaran	W.	116 14 4	3111	117 42 0	3112	119 9 55	3113	120 37 49	3114
	Pollux	W.	72 13 35	3078	73 42 11	3079	75 10 46	3078	76 39 22	3078
	Regulus	W.	36 5 59	3116	37 33 49	3114	39 1 42	3111	40 29 38	3108
	Mars	E.	35 27 49	3313	34 3 52	3313	32 39 56	3313	31 16 0	3312
	Antares	E.	64 28 51	3084	63 0 22	3084	61 31 53	3085	60 3 25	3084
	Sun	E.	87 8 26	3471	85 47 30	3472	84 26 35	3471	83 5 39	3471
24	Pollux	W.	84 2 48	3066	85 31 39	3063	87 0 34	3058	88 29 35	3054
	Regulus	W.	47 50 19	3089	49 18 42	3084	50 47 11	3079	52 15 46	3073
	Antares	E.	52 40 43	3075	51 12 3	3072	49 43 19	3068	48 14 30	3065
	Sun	E.	76 20 38	3460	74 59 29	3455	73 38 15	3452	72 16 57	3446
25	Pollux	W.	95 56 14	3024	97 25 57	3017	98 55 49	3009	100 25 50	3001
	Regulus	W.	59 40 33	3040	61 9 56	3032	62 39 29	3024	64 9 12	3016
	Antares	E.	40 49 6	3039	39 19 42	3033	37 50 10	3026	36 20 30	3021
	Sun	E.	65 28 53	3415	64 6 54	3408	62 44 46	3400	61 22 29	3392
26	Pollux	W.	107 58 35	2956	109 29 43	2946	111 1 4	2935	112 32 38	2925
	Regulus	W.	71 40 34	2968	73 11 27	2958	74 42 33	2947	76 13 52	2936
	Spica	W.	18 0 41	3109	19 28 40	3078	20 57 16	3052	22 26 25	3026
	Antares	E.	28 50 9	2986	27 19 39	2981	25 49 2	2974	24 18 17	2969
	Sun	E.	54 28 31	3343	53 5 9	3333	51 41 36	3322	50 17 50	3312
27	Regulus	W.	83 54 2	2878	85 26 49	2866	86 59 52	2853	88 33 11	2841
	Spica	W.	29 59 20	2924	31 31 9	2907	33 3 19	2890	34 35 51	2874
	Sun	E.	43 15 43	3953	41 50 36	3941	40 25 15	3928	38 59 39	3916
28	Regulus	W.	96 23 53	2776	97 58 52	2763	99 34 8	2750	101 9 41	2737
	Spica	W.	42 23 38	2795	43 58 12	2780	45 33 6	2766	47 8 19	2750
	Sun	E.	31 48 2	3155	30 20 59	3144	28 53 43	3133	27 26 14	3123
29	Regulus	W.	109 11 47	2672	110 49 4	2660	112 26 38	2647	114 4 29	2635
	Spica	W.	55 9 16	2679	56 46 24	2665	58 23 51	2651	60 1 37	2638
	Sun	E.	20 6 0	3086	18 37 33	3086	17 9 6	3088	15 40 42	3097

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
20	Spica	E.	48 27 3	2996	46 56 45	3008	45 26 42	3018	43 56 52	3029
	Mars	E.	63 43 27	3199	62 17 17	3209	60 51 19	3220	59 25 33	3229
	Sun	E.	114 24 0	3353	113 0 50	3364	111 37 52	3374	110 15 6	3384
21	Aldebaran	W.	98 33 39	3062	100 2 35	3069	101 31 23	3075	103 0 3	3080
	Pollux	W.	54 26 27	3038	55 55 53	3044	57 25 11	3050	58 54 22	3055
	Spica	E.	36 30 55	3080	35 2 21	3089	33 33 58	3099	32 5 47	3109
	Mars	E.	52 19 17	3269	50 54 29	3275	49 29 48	3281	48 5 14	3287
	Sun	E.	103 23 50	3425	102 2 2	3431	100 40 21	3438	99 18 48	3444
22	Aldebaran	W.	110 21 54	3102	111 50 1	3105	113 18 5	3107	114 46 6	3110
	Pollux	W.	66 18 57	3073	67 47 40	3075	69 16 20	3077	70 44 58	3078
	Regulus	W.	30 15 7	3125	31 42 46	3123	33 10 28	3121	34 38 12	3119
	Spica	E.	24 48 2	3166	23 21 12	3181	21 54 40	3198	20 26 28	3216
	Mars	E.	41 3 51	3306	39 39 47	3309	38 15 46	3311	36 51 47	3312
	Antares	E.	70 23 5	3078	68 54 28	3079	67 25 53	3082	65 57 21	3083
	Sun	E.	92 32 26	3464	91 11 22	3467	89 50 21	3470	88 29 23	3471
23	Aldebaran	W.	122 5 42	3114	123 33 35	3113	125 1 29	3112	126 29 24	3111
	Pollux	W.	78 7 59	3077	79 36 37	3074	81 5 18	3073	82 34 1	3069
	Regulus	W.	41 57 38	3105	43 25 41	3101	44 53 49	3098	46 22 1	3093
	Mars	E.	29 52 2	3311	28 28 3	3308	27 4 1	3306	25 39 57	3304
	Antares	E.	58 34 56	3083	57 6 26	3082	55 37 54	3080	54 9 20	3078
	Sun	E.	81 44 43	3470	80 23 45	3469	79 2 46	3466	77 41 44	3463
24	Pollux	W.	89 58 41	3048	91 27 54	3043	92 57 13	3037	94 26 40	3031
	Regulus	W.	53 44 28	3068	55 13 17	3061	56 42 14	3055	58 11 19	3047
	Antares	E.	46 45 37	3060	45 16 39	3055	43 47 34	3050	42 18 23	3045
	Sun	E.	70 55 33	3441	69 34 3	3436	68 12 27	3430	66 50 44	3425
25	Pollux	W.	101 56 1	2993	103 26 23	2985	104 56 55	2975	106 27 39	2965
	Regulus	W.	65 39 5	3006	67 9 10	2997	68 39 26	2988	70 9 54	2978
	Antares	E.	34 50 43	3014	33 20 47	3007	31 50 43	3000	30 20 30	2993
	Sun	E.	60 0 3	3382	58 37 26	3373	57 14 39	3364	55 51 41	3353
26	Pollux	W.	114 4 25	2914	115 36 26	2903	117 8 42	2891	118 41 12	2880
	Regulus	W.	77 45 25	2925	79 17 12	2913	80 49 14	2902	82 21 30	2890
	Spica	W.	23 56 6	3003	25 26 15	2981	26 56 52	2961	28 27 54	2942
	Antares	E.	22 47 26	2965	21 16 29	2963	19 45 29	2961	18 14 27	2962
	Sun	E.	48 53 52	3300	47 29 40	3288	46 5 15	3276	44 40 36	3265
27	Regulus	W.	90 6 46	2828	91 40 38	2815	93 14 46	2802	94 49 11	2789
	Spica	W.	36 8 43	2858	37 41 56	2842	39 15 30	2826	40 49 24	2811
	Sun	E.	37 33 49	3204	36 7 44	3191	34 41 24	3179	33 14 50	3168
28	Regulus	W.	102 45 32	2724	104 21 40	2711	105 58 5	2698	107 34 47	2685
	Spica	W.	48 43 52	2736	50 19 44	2721	51 55 56	2707	53 32 27	2693
	Sun	E.	25 58 32	3114	24 30 39	3105	23 2 35	3097	21 34 22	3090
29	Regulus	W.	115 42 37	2623	117 21 1	2610	118 59 42	2599	120 38 39	2586
	Spica	W.	61 39 41	2624	63 18 3	2611	64 56 43	2598	66 35 41	2585
	Sun	E.	14 12 29	3114	12 44 37	3144	11 17 21	3193	9 51 3	3267

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	20 7 17.87	+ 5.151	−20 39 7.7	+53.58	1 23.8
2	20 9 1.65	3.474	20 18 5.4	51.47	1 21.5
3	20 10 3.54	+ 1.663	19 58 3.4	48.56	1 18.6
4	20 10 20.56	− 0.264	19 39 20.7	44.86	1 14.9
5	20 9 50.27	2.279	19 22 16.0	40.42	1 10.4
6	20 8 31.21	− 4.319	−19 7 5.8	+35.33	1 5.2
7	20 6 23.13	6.346	18 54 4.2	29.73	0 59.1
8	20 3 27.31	8.284	18 43 21.4	23.80	0 52.2
9	19 59 46.88	10.051	18 35 2.7	17.75	0 44.6
10	19 55 26.85	11.568	18 29 9.1	11.77	0 36.4
11	19 50 34.17	−12.761	−18 25 36.7	+ 6.02	0 27.6
12	19 45 17.37	13.570	18 24 17.2	+ 0.69	0 18.4
13	19 39 46.16	13.957	18 24 59.6	− 4.12	0 9.0 23 59.5
14	19 34 10.83	13.915	18 27 30.5	8.35	23 50.2
15	19 28 41.49	13.463	18 31 35.9	12.00	23 41.1
16	19 23 27.51	−12.644	−18 37 2.0	−15.08	23 32.3
17	19 18 36.90	11.596	18 43 35.7	17.63	23 24.0
18	19 14 16.06	10.177	18 51 4.6	19.71	23 16.4
19	19 10 29.68	8.668	18 59 18.1	21.34	23 9.3
20	19 7 20.76	7.066	19 8 5.7	22 56	23 2.8
21	19 4 50.79	− 5.431	−19 17 18.0	−23.40	22 57.0
22	19 3 0.02	3.806	19 26 46.2	23.89	22 51.9
23	19 1 47.76	2.226	19 36 21.9	24.04	22 47.4
24	19 1 12.57	− 0.719	19 45 57.3	23.86	22 43.4
25	19 1 12.57	+ 0.703	19 55 24.8	23.38	22 40.0
26	19 1 45.58	+ 2.031	−20 4 37.3	−22.62	22 37.0
27	19 2 49.27	3.261	20 13 28.4	21.59	22 34.6
28	19 4 21.33	4.395	20 21 51.8	20.32	22 32.6
29	19 6 19.46	5.434	20 29 41.9	18.82	22 31.0
30	19 8 41.45	6.384	20 36 53.6	17.12	22 29.8
31	19 11 25.22	+ 7.250	−20 43 22.3	−15.24	22 28.9
32	19 14 28.85	+ 8.040	−20 49 3.8	−13.19	22 28.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3.8	4.4	4.9	5.0	4.7	4.2	3.8
Hor. Parallax . .	10.0	11.6	13.0	13.2	12.3	11.1	10.0

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 14 28.85	+ 8.040	−20 49 3.8	−13.19	22 28.3
2	19 17 50.56	8.758	20 53 54.1	10.99	22 28.0
3	19 21 28.70	9.410	20 57 49.9	8.65	22 27.9
4	19 25 21.78	10.003	21 0 48.2	6.19	22 28.1
5	19 29 28.43	10.543	21 2 46.3	3.63	22 28.4
6	19 33 47.43	+11.034	−21 3 41.7	− 0.97	22 29.0
7	19 38 17.68	11.480	21 3 32.4	+ 1.77	22 29.7
8	19 42 58.14	11.856	21 2 16.5	4.58	22 30.6
9	19 47 47.90	12.256	20 59 52.3	7.45	22 31.6
10	19 52 46.15	12.593	20 56 18.5	10.38	22 32.7
11	19 57 52.13	+12.901	−20 51 33.5	+13.37	22 34.0
12	20 3 5.17	13.182	20 45 36.5	16.39	22 35.4
13	20 8 24.67	13.439	20 38 26.6	19.44	22 36.9
14	20 13 50.07	13.674	20 30 2.7	22.54	22 38.4
15	20 19 20.87	13.889	20 20 24.1	25.67	22 40.1
16	20 24 56.61	+14.086	−20 9 30.2	+28.81	22 41.8
17	20 30 36.90	14.269	19 57 20.7	31.98	22 43.6
18	20 36 21.40	14.437	19 43 54.9	35.18	22 45.5
19	20 42 9.77	14.591	19 29 12.2	38.38	22 47.4
20	20 48 1.71	14.734	19 13 12.6	41.59	22 49.4
21	20 53 56.95	+14.867	−18 55 55.8	+44.81	22 51.4
22	20 59 55.26	14.991	18 37 21.4	48.05	22 53.5
23	21 5 56.44	15.106	18 17 29.3	51.30	22 55.6
24	21 12 0.31	15.215	17 56 19.2	54.55	22 57.8
25	21 18 6.71	15.317	17 33 51.1	57.80	23 0.0
26	21 24 15.50	+15.415	−17 10 4.9	+61.05	23 2.2
27	21 30 26.57	15.507	16 45 0.6	64.31	23 4.5
28	21 36 39.81	15.596	16 18 38.2	67.56	23 6.8
29	21 42 55.15	15.682	15 50 57.6	70.82	23 9.2
30	21 49 12.52	15.765	15 21 59.0	74.07	23 11.6
31	21 55 31.87	+15.847	−14 51 42.4	+77.32	23 14.0
32	22 1 53.18	+15.998	−14 20 7.8	+80.56	23 16.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	3.4	3.2	3.0	2.8	2.7
Hor. Parallax	9.1	8.4	7.9	7.4	7.1

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 42 55.15	+15.682	−15 50 57.6	+ 70.82	23 9.2
2	21 49 12.52	15.765	15 21 59.0	74.07	23 11.6
3	21 55 31.87	15.847	14 51 42.4	77.32	23 14.0
4	22 1 53.18	15.928	14 20 7.8	80.56	23 16.4
5	22 8 16.42	16.009	13 47 15.5	83.80	23 18.9
6	22 14 41.61	+16.090	−13 13 5.7	+ 87.02	23 21.4
7	22 21 8.75	16.172	12 37 38.5	90.24	23 24.0
8	22 27 37.87	16.255	12 0 54.3	93.44	23 26.6
9	22 34 9.01	16.340	11 22 53.4	96.63	23 29.2
10	22 40 42.20	16.427	10 43 36.2	99.80	23 31.8
11	22 47 17.52	+16.515	−10 3 3.4	+102.94	23 34.5
12	22 53 55.04	16.610	9 21 15.5	106.06	23 37.2
13	23 0 34.83	16.706	8 38 13.0	109.14	23 40.0
14	23 7 16.97	16.806	7 53 57.0	112.19	23 42.8
15	23 14 1.54	16.909	7 8 28.4	115.18	23 45.6
16	23 20 48.64	+17.016	− 6 21 48.6	+118.12	23 48.5
17	23 27 38.35	17.127	5 33 58.9	121.00	23 51.5
18	23 34 30.76	17.241	4 45 1.2	123.80	23 54.6
19	23 41 25.94	17.358	3 54 57.5	126.49	23 57.6
20	23 48 23.93	17.477	3 3 50.4	129.06	
21	23 55 24.77	+17.595	− 2 11 42.8	+131.53	0 0.6
22	0 2 28.46	17.713	1 18 38.3	133.82	0 3.7
23	0 9 34.97	17.829	− 0 24 41.0	135.92	0 6.8
24	0 16 44.21	17.940	+ 0 30 4.2	137.81	0 10.0
25	0 23 56.05	18.045	1 25 31.8	139.44	0 13.3
26	0 31 10.28	+18.139	+ 2 21 35.2	+140.79	0 16.6
27	0 38 26.63	18.220	3 18 7.0	141.80	0 20.0
28	0 45 44.71	18.283	4 14 58.7	142.44	0 23.3
29	0 53 4.04	18.324	5 12 0.9	142.66	0 26.7
30	1 0 24.03	18.338	6 9 3.0	142.43	0 30.1
31	1 7 44.01	+18.321	+ 7 5 54.0	+141.72	0 33.5
32	1 15 3.15	+18.268	+ 8 2 21.5	+140.48	0 36.9

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 15 3.15	+18.268	+ 8 2 21.5	+140.48	0 36.9
2	1 22 20.52	18.173	8 58 12.4	138.68	0 40.3
3	1 29 35.08	18.033	9 53 13.5	136.32	0 43.6
4	1 36 45.71	17.844	10 47 11.0	133.39	0 46.8
5	1 43 51.20	17.604	11 39 51.4	129.89	0 49.9
6	1 50 50.28	+17.310	+12 31 1.5	+125.86	0 53.0
7	1 57 41.67	16.962	13 20 28.8	121.33	0 55.9
8	2 4 24.05	16.560	14 8 1.6	116.33	0 58.7
9	2 10 56.13	16.104	14 53 29.2	110.91	1 1.3
10	2 17 16.65	15.597	15 36 42.4	105.13	1 3.7
11	2 23 24.39	+15.040	+16 17 33.2	+ 99.05	1 5.8
12	2 29 18.21	14.437	16 55 54.9	92.72	1 7.8
13	2 34 57.01	13.790	17 31 42.1	86.19	1 9.5
14	2 40 19.78	13.101	18 4 50.6	79.50	1 10.9
15	2 45 25.56	12.375	18 35 17.2	72.70	1 12.0
16	2 50 13.50	+11.615	+19 2 59.8	+ 65.83	1 12.9
17	2 54 42.80	10.822	19 27 56.6	58.90	1 13.4
18	2 58 52.72	10.000	19 50 6.8	51.95	1 13.6
19	3 2 42.59	9.152	20 9 30.0	44.98	1 13.5
20	3 6 11.82	8.280	20 26 6.1	38.02	1 13.0
21	3 9 19.89	+ 7.380	+20 39 55.0	+ 31.06	1 12.2
22	3 12 6.38	6.462	20 50 57.2	24.12	1 11.0
23	3 14 30.92	5.562	20 59 13.2	17.21	1 9.5
24	3 16 33.28	4.634	21 4 43.6	10.33	1 7.6
25	3 18 13.33	3.704	21 7 29.3	+ 3.49	1 5.3
26	3 19 31.09	+ 2.777	+21 7 31.6	− 3.28	1 2.6
27	3 20 26.71	1.861	21 4 52.3	9.98	0 59.6
28	3 21 0.55	0.962	20 59 33.5	16.57	0 56.2
29	3 21 13.12	+ 0.069	20 51 38.3	23.01	0 52.5
30	3 21 5.15	− 0.748	20 41 10.6	29.26	0 48.4
31	3 20 37.60	− 1.540	+20 28 15.6	− 35.37	0 44.0
32	3 19 51.68	− 2.278	+20 13 0.1	− 40.97	0 39.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2″.6	2″.5	2″.5	2″.5	2″.5	2″.5
Hor. Parallax . .	6.9	6.7	6.6	6.5	6.5	6.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	2″.6	2″.9	3″.2	3″.6	4″.2	4″.8
Hor. Parallax . .	7.0	7.6	8.4	9.6	11.0	12.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 20 37.60	−1.540	+20 28 15.6	−35.27	0 44.0
2	3 19 51.68	2.278	20 13 0.1	40.97	0 39.3
3	3 18 48.78	2.952	19 55 32.0	46.30	0 34.3
4	3 17 30.57	3.553	19 36 1.1	51.18	0 29.1
5	3 15 58.89	4.073	19 14 39.5	55.52	0 23.6
6	3 14 15.78	−4.503	+18 51 40.7	−59.27	0 18.0
7	3 12 23.48	4.838	18 27 19.8	62.35	0 12.2
8	3 10 24.31	5.075	18 1 54.0	64.67	0 6.3
9	3 8 20.66	5.211	17 35 41.8	66.21	0 0.3 23 54.3
10	3 6 14.95	5.246	17 9 2.6	66.92	23 48.3
11	3 4 9.61	−5.182	+16 42 16.3	−66.79	23 42.3
12	3 2 6.95	5.023	16 15 43.3	65.83	23 36.4
13	3 0 9.19	4.776	15 49 43.1	64.06	23 30.7
14	2 58 18.34	4.447	15 24 34.4	61.53	23 25.0
15	2 56 36.31	4.044	15 0 35.2	58.29	23 19.6
16	2 55 4.75	−3.576	+14 38 1.4	−54.42	23 14.3
17	2 53 45.09	3.054	14 17 7.3	50.00	23 9.3
18	2 52 38.55	2.485	13 58 4.9	45.13	23 4.5
19	2 51 46.12	1.879	13 41 4.2	39.88	22 59.9
20	2 51 8.60	1.244	13 26 13.2	34.35	22 55.6
21	2 50 46.58	−0.588	+13 13 37.8	−28.61	22 51.6
22	2 50 40.49	+0.082	13 3 21.6	22.74	22 47.5
23	2 50 50.60	0.761	12 55 26.9	16.82	22 44.3
24	2 51 17.04	1.443	12 49 54.4	10.90	22 41.0
25	2 51 59.65	2.124	12 46 43.2	− 5.05	22 38.1
26	2 52 58.97	+2.801	+12 45 51.2	+ 0.69	22 35.4
27	2 54 14.25	3.471	12 47 15.4	6.29	22 32.9
28	2 55 45.53	4.133	12 50 52.0	11.79	22 30.7
29	2 57 32.58	4.786	12 56 36.6	16.95	22 28.8
30	2 59 35.18	5.428	13 4 24.2	21.97	22 27.2
31	3 1 53.07	+6.061	+13 14 9.4	+26.76	22 25.8
32	3 4 26.01	+6.683	+13 25 46.6	+31.30	22 24.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter . .	5.4	5.8	6.0	5.9	5.6	5.1	4.6
Hor. Parallax . .	14.2	15.5	16.0	15.7	14.7	13.4	12.1

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 4 26.01	+ 6.683	+13 25 46.6	+31.30	22 24.6
2	3 7 13.77	7.295	13 39 9.8	35.59	22 23.7
3	3 10 16.11	7.898	13 54 13.0	39.63	22 23.0
4	3 13 32.84	8.494	14 10 50.1	43.41	22 22.6
5	3 17 3.78	9.084	14 28 54.4	46.93	22 22.4
6	3 20 48.80	+ 9.668	+14 48 20.1	+50.18	22 22.4
7	3 24 47.79	10.248	15 9 0.7	53.16	22 22.7
8	3 29 0.67	10.825	15 30 49.6	55.87	22 23.2
9	3 33 27.40	11.402	15 53 40.2	58.31	22 23.9
10	3 38 7.96	11.979	16 17 26.1	60.47	22 24.8
11	3 43 2.39	+12.558	+16 42 0.3	+62.34	22 26.0
12	3 48 10.74	13.139	17 7 15.9	63.92	22 27.4
13	3 53 33.08	13.724	17 33 5.9	65.19	22 29.1
14	3 59 9.52	14.314	17 59 22.6	66.15	22 31.0
15	4 5 0.18	14.909	18 25 58.6	66.79	22 33.1
16	4 11 5.18	+15.509	+18 52 45.6	+67.07	22 35.5
17	4 17 24.65	16.114	19 19 35.1	66.99	22 38.1
18	4 23 58.69	16.724	19 46 18.3	66.54	22 40.9
19	4 30 47.41	17.337	20 12 45.8	65.68	22 44.0
20	4 37 50.85	17.950	20 38 47.7	64.40	22 47.4
21	4 45 9.00	+18.561	+21 4 13.5	+62.68	22 51.0
22	4 52 41.75	19.167	21 28 52.4	60.49	22 54.8
23	5 0 28.95	19.764	21 52 32.9	57.81	22 58.9
24	5 8 30.31	20.345	22 15 3.1	54.63	23 3.2
25	5 16 45.35	20.904	22 36 11.2	50.95	23 7.8
26	5 25 13.49	+21.436	+22 55 44.8	+46.77	23 12.5
27	5 33 53.98	21.932	23 13 31.9	42.08	23 17.4
28	5 42 45.86	22.384	23 29 20.7	36.91	23 22.5
29	5 51 47.98	22.784	23 43 0.0	31.30	23 27.8
30	6 0 59.05	23.128	23 54 19.7	25.28	23 33.2
31	6 10 17.62	+23.408	+24 3 10.8	+18.92	23 38.7
32	6 19 42.09	+23.619	+24 9 25.7	+12.26	23 44.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . .	4.1	3.7	3.3	3.0	2.8	2.6
Hor. Parallax . .	10.8	9.7	8.8	8.0	7.3	6.9

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 10 17.62	+23.408	+24 3 10.8	+18.92	23 38.7	1	10 15 50.72	+13.805	+11 22 15.1	−99.15	1 36.7
2	6 19 42.09	23.619	24 9 25.7	12.28	23 44.2	2	10 21 17.76	13.449	10 42 35.8	99.10	1 38.2
3	6 29 10.78	23.759	24 12 58.4	+ 5.43	23 49.8	3	10 26 36.31	13.098	10 2 59.4	98.90	1 39.6
4	6 38 41.96	23.836	24 13 45.3	− 1.54	23 55.4	4	10 31 46.46	12.749	9 23 29.7	98.55	1 40.8
5	6 48 13.87	23.821	24 11 44.2	8.56		5	10 36 48.25	12.402	8 44 10.4	98.04	1 41.9
6	6 57 44.82	+23.746	+24 6 54.8	−15.54	0 1.0	6	10 41 41.73	+12.056	+ 8 5 5.1	−97.38	1 42.8
7	7 7 13.19	23.606	23 59 19.0	22.48	0 6.6	7	10 46 26.90	11.709	7 26 17.5	96.56	1 43.6
8	7 16 37.45	23.406	23 49 0.3	29.12	0 12.1	8	10 51 3.74	11.361	6 47 51.3	95.59	1 44.3
9	7 25 56.25	23.159	23 36 3.6	35.56	0 17.5	9	10 55 32.19	11.009	6 9 50.2	94.47	1 44.8
10	7 35 8.35	22.850	23 20 34.8	41.77	0 22.7	10	10 59 52.16	10.654	5 32 18.0	93.19	1 45.2
11	7 44 12.73	+22.509	+23 2 41.2	−47.64	0 27.9	11	11 4 3.53	+10.293	+ 4 55 18.4	−91.75	1 45.4
12	7 53 8.50	22.134	22 42 30.8	53.17	0 32.9	12	11 8 6.16	9.924	4 18 55.4	90.14	1 45.5
13	8 1 54.94	21.733	22 20 11.7	58.38	0 37.7	13	11 11 59.83	9.546	3 43 13.3	88.35	1 45.4
14	8 10 31.50	21.319	21 55 52.5	63.16	0 42.4	14	11 15 44.30	9.158	3 8 16.4	86.37	1 45.2
15	8 18 57.78	20.876	21 29 42.1	67.63	0 46.9	15	11 19 19.31	8.757	2 34 9.2	84.20	1 44.9
16	8 27 13.47	+20.430	+21 1 48.9	−71.73	0 51.2	16	11 22 44.51	+ 8.341	+ 2 0 56.6	−81.89	1 44.3
17	8 35 18.38	19.978	20 32 21.6	75.48	0 55.4	17	11 25 59.54	7.909	1 28 43.6	79.22	1 43.6
18	8 43 12.43	19.526	20 1 28.4	78.89	0 59.3	18	11 29 3.98	7.458	0 57 35.7	76.39	1 42.7
19	8 50 55.62	19.074	19 29 17.3	81.98	1 3.1	19	11 31 57.35	6.986	+ 0 27 38.8	73.31	1 41.7
20	8 58 27.98	18.624	18 55 55.8	84.76	1 6.7	20	11 34 39.14	6.491	− 0 1 0.9	69.95	1 40.4
21	9 5 49.61	+18.180	+18 21 31.2	−87.24	1 10.1	21	11 37 8.74	+ 5.971	− 0 28 16.7	−66.31	1 38.9
22	9 13 0.67	17.749	17 46 10.3	89.45	1 13.4	22	11 39 25.54	5.424	0 54 1.4	62.36	1 37.3
23	9 20 1.31	17.312	17 9 59.7	91.39	1 16.4	23	11 41 28.84	4.847	1 18 7.2	58.06	1 35.4
24	9 26 51.73	16.890	16 33 5.4	93.09	1 19.3	24	11 43 17.92	4.236	1 40 25.5	53.40	1 33.3
25	9 33 32.11	16.476	15 55 33.3	94.55	1 22.1	25	11 44 51.98	3.595	2 0 47.3	48.35	1 30.9
26	9 40 2.66	+16.071	+15 17 28.9	−95.79	1 24.6	26	11 46 10.19	+ 2.917	− 2 19 3.2	−42.89	1 28.2
27	9 46 23.60	15.675	14 38 57.3	96.86	1 27.0	27	11 47 11.72	2.204	2 35 2.7	36.99	1 25.3
28	9 52 35.13	15.287	14 0 3.4	97.64	1 29.3	28	11 47 55.70	1.455	2 48 35.0	30.69	1 22.1
29	9 58 37.44	14.907	13 20 51.9	98.32	1 31.4	29	11 48 21.28	+ 0.671	2 59 28.7	23.77	1 18.5
30	10 4 30.70	14.533	12 41 27.2	98.74	1 33.3	30	11 48 27.66	− 0.145	3 7 32.0	16.49	1 14.7
31	10 10 15.07	+14.166	+12 1 53.5	−99.03	1 35.1	31	11 48 14.07	− 0.990	− 3 12 32.8	− 8.57	1 10.5
32	10 15 50.72	+13.805	+11 22 15.1	−99.15	1 36.7	32	11 47 39.90	− 1.859	− 3 14 19.5	− 0.94	1 6.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	2″.5	2″.5	2″.5	2″.6	2″.7	2″.9	Semidiameter . .	3″.1	3″.3	3″.5	3″.8	4″.2	4″.5
Hor. Parallax . .	6.7	6.7	6.8	7.0	7.3	7.7	Hor. Parallax . .	8.1	8.7	9.3	10.1	11.0	12.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 47 39.90	−1.859	−3 14 19.5	− 0.24	1 6.0
2	11 46 44.71	2.743	3 12 40.7	+ 8.55	1 1.1
3	11 45 28.25	3.629	3 7 26.1	17.74	0 55.9
4	11 43 50.62	4.505	2 58 27.0	27.23	0 50.4
5	11 41 52.25	5.353	2 45 37.7	36.91	0 44.5
6	11 39 34.05	−6.154	−2 28 55.1	+46.63	0 38.2
7	11 36 57.45	6.883	2 8 21.0	56.17	0 31.7
8	11 34 4.46	7.515	1 44 2.2	65.31	0 24.9
9	11 30 57.71	8.025	1 16 11.5	73.78	0 17.9
10	11 27 40.42	8.388	0 45 8.6	81.28	0 10.7
11	11 24 16.45	−8.578	−0 11 20.0	+87.53	0 3.4 23 56.0
12	11 20 50.17	8.578	+0 24 41.2	92.28	23 48.7
13	11 17 26.31	8.374	1 2 15.8	95.29	23 41.5
14	11 14 9.91	7.957	1 40 39.9	96.39	23 34.6
15	11 11 6.04	7.331	2 19 6.9	95.50	23 27.9
16	11 8 19.60	− 6.506	+2 56 48.4	+92.62	23 21.5
17	11 5 55.19	5.499	3 32 57.6	87.83	23 15.6
18	11 3 56.89	4.334	4 6 50.3	81.27	23 10.2
19	11 2 28.18	3.039	4 37 46.2	73.15	23 5.3
20	11 1 31.78	1.647	5 5 10.9	63.72	23 1.0
21	11 1 9.63	− 0.191	+5 28 36.1	+53.24	22 57.3
22	11 1 22.86	+ 1.296	5 47 40.0	41.98	22 54.2
23	11 2 11.84	2.783	6 2 7.0	30.21	22 51.6
24	11 3 36.22	4.242	6 11 48.1	18.19	22 49.6
25	11 5 35.04	5.649	6 16 39.8	+ 6.12	22 48.2
26	11 8 6.80	+ 6.984	+6 16 43.2	− 5.79	22 47.2
27	11 11 9.55	8.230	6 12 4.7	17.36	22 46.8
28	11 14 41.01	9.375	6 2 53 9	28.45	22 46.8
29	11 18 38.67	10.412	5 49 23.9	38 95	22 47.2
30	11 22 59.68	11.338	5 31 50.1	48.75	22 47.9
31	11 27 41.99	+12.153	+5 10 30.1	−57.79	22 49.0
32	11 32 42.36	+12.860	+4 45 42.4	−66.05	22 50.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	4″.9	5″.2	5″.2	4″.8	4″.1	3″.5
Hor. Parallax . .	13.1	13.8	13.7	12.6	11.0	9.4

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 27 41.99	+12.153	+ 5 10 30.1	− 57.79	22 49.0
2	11 32 42.36	12.860	4 45 42.4	66.05	22 50.3
3	11 37 58.44	13.464	4 17 46.4	73.49	22 51.8
4	11 43 27.85	13.972	3 47 1.5	80.18	22 53.5
5	11 49 8.40	14.393	3 13 47.1	85 95	22 55.4
6	11 54 58.11	+14 737	+ 2 38 22.0	− 91.02	22 57.4
7	12 0 55.23	15.012	2 1 3.9	95.38	22 59.6
8	12 6 58.21	15.227	1 22 9.4	99.06	23 1.8
9	12 13 5.71	15.391	0 41 54.2	102.12	23 4.0
10	12 19 16.62	15.512	+ 0 0 32.5	104.60	23 6.3
11	12 25 30.00	+15.598	− 0 41 42.6	−106.58	23 8.6
12	12 31 45.08	15 654	1 24 39.7	108.10	23 10.9
13	12 38 1.22	15.688	2 8 8.0	109.20	23 13.2
14	12 44 17.93	15.702	2 51 58.3	109.93	23 15.6
15	12 50 34.81	15.702	3 36 2.1	110.33	23 17.9
16	12 56 51.57	+15.692	− 4 20 11.9	−110.44	23 20.2
17	13 3 7.98	15.675	5 4 21.1	110.29	23 22.6
18	13 9 23.92	15.652	5 48 24.1	109.92	23 24.9
19	13 15 39.28	15.627	6 32 15.5	109.34	23 27.2
20	13 21 54.02	15.601	7 15 50.8	108.58	23 29.5
21	13 28 8.12	+15.575	− 7 59 6.0	−107.66	23 31.8
22	13 34 21.63	15.551	8 41 57.4	106.60	23 34.1
23	13 40 34.57	15.528	9 24 21.7	105.41	23 36.3
24	13 46 47 01	15.509	10 6 16.2	104.11	23 38.6
25	13 52 59.03	15.493	10 47 38.1	102.70	23 40.9
26	13 59 10.71	+15.481	−11 28 25.0	−101.20	23 43.1
27	14 5 22.15	15.474	12 8 34.8	99.61	23 45.3
28	14 11 33.48	15.471	12 48 5.5	97.94	23 47.6
29	14 17 44.78	15.472	13 26 55.2	96.19	23 49.9
30	14 23 56.15	15.478	14 5 2.3	94.38	23 52.1
31	14 30 7.74	+15.488	−14 42 25.1	− 92.51	23 54.4
32	14 36 19.62	+15.503	−15 19 2.2	− 90.57	23 56.6

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	3″.1	2″.8	2″.6	2″.4	2″.4	2″.3
Hor. Parallax . .	8.2	7.4	6.8	6.5	6.3	6.2

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	14 36 19.62	+15.503	−15 19 2.2	−90.57	23 56.6
2	14 42 31.90	15.521	15 54 51.9	88.56	23 58.9
3	14 48 44.67	15.544	16 29 52.7	86.50	
4	14 54 58.06	15.571	17 4 3.3	84.38	0 1.2
5	15 1 12.11	15.601	17 37 22.5	82.21	0 3.5
6	15 7 26.94	+15.635	−18 9 48.8	−79.98	0 5.8
7	15 13 42.60	15.671	18 41 21.0	77.69	0 8.1
8	15 19 59.18	15.710	19 11 57.7	75.35	0 10.5
9	15 26 16.72	15.752	19 41 37.6	72.96	0 12.8
10	15 32 35.28	15.795	20 10 19.3	70.51	0 15.2
11	15 38 54.89	+15.839	−20 38 1.7	−68.01	0 17.6
12	15 45 15.57	15.885	21 4 43.4	65.45	0 20.0
13	15 51 37.35	15.930	21 30 22.8	62.83	0 22.4
14	15 58 0.22	15.975	21 54 58.7	60.16	0 24.8
15	16 4 24.16	16.019	22 18 30.0	57.43	0 27.3
16	16 10 49.14	+16.062	−22 40 55.0	−54.64	0 29.8
17	16 17 15.10	16.102	23 2 12.3	51.79	0 32.3
18	16 23 41.97	16.138	23 22 20.4	48.88	0 34.8
19	16 30 9.67	16.169	23 41 18.1	45.91	0 37.3
20	16 36 38.05	16.195	23 59 3.8	42.88	0 39.9
21	16 43 6.96	+16.214	−24 15 36.0	−39.79	0 42.4
22	16 49 36.24	16.225	24 30 53.3	36.64	0 44.9
23	16 56 5.66	16.227	24 44 54.3	33.43	0 47.5
24	17 2 34.96	16.217	24 57 37.6	30.17	0 50.1
25	17 9 3.87	16.192	25 9 1.8	26.84	0 52.6
26	17 15 32.02	+16.152	−25 19 5.4	−23.46	0 55.1
27	17 21 59.02	16.095	25 27 47.3	20.03	0 57.6
28	17 28 24.41	16.017	25 35 6.2	16.55	1 0.1
29	17 34 47.66	15.915	25 41 1.1	13.02	1 2.6
30	17 41 8.16	15.788	25 45 30.9	9.48	1 5.0
31	17 47 25.27	+15.632	−25 48 35.0	− 5.88	1 7.3
32	17 53 38.20	+15.440	−25 50 12.7	− 2.27	1 9.6

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	17 47 25.27	+15.632	−25 48 35.0	− 5.88	1 7.3
2	17 53 38.20	15.440	25 50 12.7	− 2.27	1 9.6
3	17 59 46.06	15.208	25 50 23.7	+ 1.35	1 11.8
4	18 5 47.82	14.932	25 49 8.0	4.96	1 13.8
5	18 11 42.38	14.606	25 46 25.9	8.55	1 15.8
6	18 17 28.43	+14.222	-25 42 18.1	+12.10	1 17.6
7	18 23 4.52	13.774	25 36 45.8	15.58	1 19.3
8	18 28 28.99	13.253	25 29 50.7	18.99	1 20.7
9	18 33 40.00	12.648	25 21 35.3	22.27	1 22.0
10	18 38 35.38	11.952	25 12 2.8	25.41	1 23.0
11	18 43 12.87	+11.154	−25 1 16.9	+28.38	1 23.6
12	18 47 29.85	10.241	24 49 22.5	31.12	1 23.9
13	18 51 23.44	9.202	24 36 25.4	33.60	1 23.8
14	18 54 50.47	8.027	24 22 32.3	35.78	1 23.3
15	18 57 47.58	6.707	24 7 50.6	37.63	1 22.3
16	19 0 11.18	+ 5.234	−23 52 29.0	+39.10	1 20.7
17	19 1 57.57	3.606	23 36 36.8	40.17	1 18.5
18	19 3 3.07	+ 1.828	23 20 23.8	40.83	1 15.6
19	19 3 24.24	− 0.066	23 4 0.1	41.07	1 12.0
20	19 2 58.09	2.110	22 47 35.7	40.89	1 7.6
21	19 1 42.39	− 4.206	−22 31 20.5	+40.32	1 2.4
22	18 59 36.09	6.316	22 15 23.1	39.41	0 56.3
23	18 56 39.71	8.366	21 59 51.3	38.19	0 49.5
24	18 52 55.68	10.271	21 44 52.2	36.69	0 41.8
25	18 48 28.61	11.937	21 30 32.4	34.92	0 33.4
26	18 43 25.35	−13.271	−21 16 58.5	+32.87	0 24.5
27	18 37 54.82	14.198	21 4 17.4	30.50	0 15.1
28	18 32 7.50	14.663	20 52 37.4	27.76	0 5.4 23 55.7
29	18 26 14.80	14.646	20 42 8.1	24.60	23 46.1
30	18 20 28.16	14.164	20 32 59.8	21.02	23 36.7
31	18 14 58.22	−13.265	−20 25 22.6	+17.02	23 27.7
32	18 9 54.20	−12.019	−20 19 25.7	+12.68	23 19.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	2″.3	2″.3	2″.4	2″.4	2″.5	2″.6
Hor. Parallax . . .	6.1	6.2	6.2	6.4	6.6	6.9

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	2″.8	3″.1	3″.4	3″.9	4″.5	4″.9	4″.9
Hor. Parallax . .	7.4	8.1	9.0	10.3	11.9	13.0	12.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	16 18 0.38	+3.156	−16 49 19.1	+ 2.08	21 32.3	1	17 43 58.51	+ 9.615	−19 13 14.5	−12.70	20 58.2
2	16 19 20.13	3.486	16 48 51.0	+ 0.29	21 29.8	2	17 47 50.66	9.731	19 18 12.1	12.09	20 58.2
3	16 20 47.66	3.805	16 49 4.5	− 1.40	21 27.4	3	17 51 45.54	9.842	19 22 54.5	11.43	20 58.2
4	16 22 22.74	4.115	16 49 57.4	2.99	21 25.2	4	17 55 43.05	9.949	19 27 20.6	10.73	20 58.3
5	16 24 5.12	4.414	16 51 27.2	4.48	21 23.1	5	17 59 43.08	10.052	19 31 29.3	9.98	20 58.4
6	16 25 54.56	+4.703	−16 53 31.6	− 5.87	21 21.0	6	18 3 45.54	+10.151	−19 35 19.6	− 9.19	20 58.5
7	16 27 50.81	4.982	16 56 8.0	7.15	21 19.1	7	18 7 50.32	10.246	19 38 50.5	8.37	20 58.7
8	16 29 53.64	5.252	16 59 14.2	8.34	21 17.3	8	18 11 57.33	10.337	19 42 1.1	7.51	20 58.9
9	16 32 2.82	5.512	17 2 47.7	9.43	21 15.6	9	18 16 6.46	10.424	19 44 50.5	6.61	20 59.2
10	16 34 18.14	5.763	17 6 46.3	10.43	21 14.0	10	18 20 17.64	10.507	19 47 18.0	5.68	20 59.5
11	16 36 39.38	+6.005	−17 11 7.8	−11.33	21 12.5	11	18 24 30.76	+10.586	−19 49 22.8	− 4.72	20 59.8
12	16 39 6.34	6.239	17 15 49.9	12.15	21 11.1	12	18 28 45.74	10.662	19 51 4.1	3.72	21 0.1
13	16 41 38.82	6.465	17 20 50.5	12.88	21 9.8	13	18 33 2.50	10.734	19 52 21.1	2.70	21 0.5
14	16 44 16.64	6.684	17 26 7.4	13.52	21 8.5	14	18 37 20.95	10.802	19 53 13.3	1.65	21 0.9
15	16 46 59.61	6.895	17 31 38.5	14.08	21 7.3	15	18 41 41.01	10.868	19 53 40.0	− 0.57	21 1.3
16	16 49 47.58	+7.100	−17 37 22.0	−14.55	21 6.3	16	18 46 2.61	+10.930	−19 53 40.7	+ 0.53	21 1.7
17	16 52 40.37	7.298	17 43 16.0	14.95	21 5.3	17	18 50 25.68	10.990	19 53 14.7	1.65	21 2.2
18	16 55 37.84	7.490	17 49 18.4	15.26	21 4.4	18	18 54 50.13	11.046	19 52 21.6	2.79	21 2.7
19	16 58 39.83	7.676	17 55 27.6	15.50	21 3.6	19	18 59 15.89	11.100	19 51 0.9	3.95	21 3.2
20	17 1 46.21	7.855	18 1 41.7	15.67	21 2.8	20	19 3 42.90	11.150	19 49 12.1	5.13	21 3.7
21	17 4 56.82	+8.028	−18 7 59.0	−15.77	21 2.1	21	19 8 11.08	+11.198	−19 46 54.8	+ 6.32	21 4.2
22	17 8 11.54	8.197	18 14 17.9	15.80	21 1.5	22	19 12 40.37	11.242	19 44 8.7	7.53	21 4.7
23	17 11 30.25	8.360	18 20 36.8	15.76	21 0.9	23	19 17 10.70	11.284	19 40 53.3	8.75	21 5.3
24	17 14 52.82	8.519	18 26 54.0	15.66	21 0.4	24	19 21 41.99	11.323	19 37 8.4	9.99	21 5.9
25	17 18 19.14	8.673	18 33 8.0	15.50	20 59.9	25	19 26 14.19	11.359	19 32 53.7	11.24	21 6.5
26	17 21 49.09	+8.822	−18 39 17.2	−15.27	20 59.5	26	19 30 47.22	+11.392	−19 28 9.0	+12.50	21 7.1
27	17 25 22.55	8.966	18 45 20.3	14.98	20 59.2	27	19 35 21.03	11.423	19 22 54.0	13.76	21 7.8
28	17 28 59.40	9.105	18 51 15.7	14 63	20 58.9	28	19 39 55.53	11.451	19 17 8.6	15.03	21 8.4
29	17 32 39.53	9.239	18 57 2.2	14.23	20 58.7	29	19 44 30.66	11.476	19 10 52.6	16.31	21 9.1
30	17 36 22.83	9.369	19 2 38.4	13.77	20 58.5	30	19 49 6.36	11.498	19 4 5.9	17.59	21 9.8
31	17 40 9.19	+9.494	−19 8 2.9	−13.28	20 58.3	31	19 53 42.56	+11.518	−18 56 48.3	+18.88	21 10.5
32	17 43 58.51	+9.615	−19 13 14.5	−12.70	20 58.2	32	19 58 19.18	+11.535	−18 48 59.8	+20.16	21 11.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	23″.5	21″.6	19″.9	18″.4	17″.0	15″.9	14″.8
Hor. Parallax . .	24.3	22.4	20.6	19.0	17.6	16.4	15.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	13″.9	13″.1	12″.4	11″.7	11″.1
Hor. Parallax	14.4	13.6	12.8	12.1	11.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	19 44 30.66	+11.476	−19 10 52.6	+16.31	21 9.1
2	19 49 6.36	11.498	19 4 5.9	17.59	21 9.8
3	19 53 42.56	11.518	18 56 48.3	18.88	21 10.5
4	19 58 19.18	11.535	18 48 59.8	20.16	21 11.2
5	20 2 56.17	11.549	18 40 40.3	21.45	21 11.9
6	20 7 33.49	+11.560	−18 31 50.1	+22.73	21 12.6
7	20 12 11.05	11.569	18 22 29.2	24.01	21 13.2
8	20 16 48.80	11.575	18 12 37.8	25.28	21 13.9
9	20 21 26.70	11.580	18 2 16.0	26.54	21 14.5
10	20 26 4.66	11.582	17 51 23.9	27.80	21 15.2
11	20 30 42.66	+11.583	−17 40 1.7	+29.05	21 15.9
12	20 35 20.65	11.581	17 28 9.6	30.29	21 16.6
13	20 39 58.58	11.578	17 15 47.7	31.52	21 17.2
14	20 44 36.40	11.573	17 2 56.5	32.74	21 17.9
15	20 49 14.09	11.567	16 49 36.2	33.95	21 18.6
16	20 53 51.60	+11.559	−16 35 47.0	+35.14	21 19.3
17	20 58 28.91	11.550	16 21 29.3	36.32	21 20.0
18	21 3 5.97	11.539	16 6 43.5	37.49	21 20.7
19	21 7 42.77	·11.528	15 51 29.8	38.64	21 21.3
20	21 12 19.28	11.515	15 35 48.7	39.78	21 22.0
21	21 16 55.48	+11.500	−15 19 40.5	+40.90	21 22.6
22	21 21 31.35	11.487	15 3 5.6	42.00	21 23.3
23	21 26 6.87	11.472	14 46 4.5	43.09	21 23.9
24	21 30 42.02	11.456	14 28 37.4	44.16	21 24.6
25	21 35 16.79	11.440	14 10 44.9	45.21	21 25.2
26	21 39 51.16	+11.424	−13 52 27.5	+46.24	21 25.9
27	21 44 25.14	11.407	13 33 45.6	47.25	21 26.5
28	21 48 58.71	11.390	13 14 39.6	48.24	21 27.1
29	21 53 31.86	11.372	12 55 10.0	49.21	21 27.7
30	21 58 4.57	11.354	12 35 17.4	50.16	21 28.3
31	22 2 36.83	+11.336	−12 15 2.3	+51.09	21 28.9
32	22 7 8.64	+11.316	−11 54 25.2	+52.00	21 29.5

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 7 8.64	+11.316	−11 54 25.2	+52.00	21 29.5
2	22 11 40.00	11.297	11 33 26.7	52.88	21 30.0
3	22 16 10.91	11.278	11 12 7.3	53.74	21 30.6
4	22 20 41.37	11.260	10 50 27.7	54.57	21 31.1
5	22 25 11.37	11.241	10 28 28.4	55.38	21 31.7
6	22 29 40.92	+11.222	−10 6 10.0	+56.16	21 32.2
7	22 34 10.01	11.203	9 43 33.1	56.92	21 32.8
8	22 38 38.65	11.184	9 20 38.3	57.65	21 33.3
9	22 43 6.85	11.166	8 57 26.3	58.35	21 33.8
10	22 47 34.62	11.148	8 33 57.7	59.03	21 34.3
11	22 52 1.96	+11.131	− 8 10 13.1	+59.68	21 34.9
12	22 56 28.90	11.114	7 46 13.0	60.31	21 35.4
13	23 0 55.43	11.098	7 21 58.2	60.91	21 35.9
14	23 5 21.59	11.082	6 57 29.2	61.49	21 36.4
15	23 9 47.38	11.068	6 32 46.7	62.04	21 36.9
16	23 14 12.84	+11.054	− 6 7 51.4	+62.57	21 37.3
17	23 18 37.98	11.041	5 42 43.7	63.07	21 37.8
18	23 23 2.83	11.029	5 17 24.3	63.54	21 38.2
19	23 27 27.40	11.016	4 51 53.8	63.99	21 38.7
20	23 31 51.73	11.009	4 26 12.9	64.41	21 39.1
21	23 36 15.84	+11.001	− 4 0 22.2	+64.81	21 39.6
22	23 40 39.78	10.994	3 34 22.2	65.18	21 40.0
23	23 45 3.54	10.988	3 8 13.6	65.53	21 40.5
24	23 49 27.17	10.983	2 41 57.1	65.85	21 41.0
25	23 53 50.69	10.979	2 15 33.1	66.14	21 41.5
26	23 58 14.13	+10.976	− 1 49 2.4	+66.41	21 42.0
27	0 2 37.53	10.974	1 22 25.5	66.65	21 42.5
28	0 7 0.91	10.974	0 55 43.1	66.87	21 42.9
29	0 11 24.30	10.975	0 28 55.8	67.06	21 43.3
30	0 15 47.74	10.977	− 0 2 4.4	67.22	21 43.7
31	0 20 11.24	+10.980	+ 0 24 50.5	+67.35	21 44.1
32	0 24 34.83	+10.985	+ 0 51 48.2	+67.46	21 44.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . .	10.″6	10.″1	9.″7	9.″3	8.″9	8.″6
Hor. Parallax . .	11.0	10.5	10.0	9.6	9.3	8.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter . .	8.″3	8.″0	7.″8	7.″5	7.″3	7.″1
Hor. Parallax . .	8.6	8.3	8.0	7.8	7.6	7.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 20 11.24	+10.980	+ 0 24 50.5	+67.35	21 44.1
2	0 24 34.83	10.985	0 51 48.2	67.46	21 44.6
3	0 28 58.55	10.991	1 18 48.2	67.54	21 45.1
4	0 33 22.42	10.998	1 45 49.8	67.59	21 45.5
5	0 37 46.48	11.007	2 12 52.2	67.61	21 46.0
6	0 42 10.75	+11.016	+ 2 39 54.8	+67.60	21 46.5
7	0 46 35.26	11.026	3 6 56.9	67.56	21 47.0
8	0 51 0.04	11.038	3 33 57.8	67.50	21 47.4
9	0 55 25.12	11.052	4 0 56.9	67.42	21 47.9
10	0 59 50.53	11.066	4 27 53.5	67.30	21 48.4
11	1 4 16.31	+11.082	+ 4 54 46.9	+67.15	21 48.9
12	1 8 42.48	11.099	5 21 36.4	66.97	21 49.4
13	1 13 9.08	11.118	5 48 21.3	66.76	21 49.9
14	1 17 36.14	11.138	6 15 0.9	66.53	21 50.4
15	1 22 3.69	11.159	6 41 34.6	66.27	21 50.9
16	1 26 31.76	+11.181	+ 7 8 1.8	+65.99	21 51.4
17	1 31 0.39	11.205	7 34 21.8	65.68	21 51.9
18	1 35 29.60	11.230	8 0 34.1	65.34	21 52.5
19	1 39 59.43	11.257	8 26 37.7	64.96	21 53.0
20	1 44 29.92	11.285	8 52 32.0	64.56	21 53.6
21	1 49 1.10	+11.314	+ 9 18 16.6	+64.13	21 54.2
22	1 53 33.01	11.345	9 43 50.5	63.68	21 54.8
23	1 58 5.67	11.377	10 9 13.3	63.21	21 55.4
24	2 2 39.10	11.410	10 34 24.2	62.70	21 56.0
25	2 7 13.35	11.445	10 59 22.5	62.16	21 56.6
26	2 11 48.44	+11.480	+11 24 7.6	+61.59	21 57.3
27	2 16 24.40	11.517	11 48 38.8	60.99	21 58.0
28	2 21 1.25	11.554	12 12 55.2	60.37	21 58.7
29	2 25 39.02	11.593	12 36 56.3	59.72	21 59.4
30	2 30 17.73	11.633	13 0 41.4	59.04	22 0.1
31	2 34 57.41	+11.674	+13 24 9.8	+58.32	22 0.8
32	2 39 38.06	+11.715	+13 47 20.7	+57.58	22 1.6

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 39 38.06	+11.715	+13 47 20.7	+57.58	22 1.6
2	2 44 19.72	11.757	14 10 13.4	56.80	22 2.4
3	2 49 2.39	11.800	14 32 47.2	56.00	22 3.2
4	2 53 46.10	11.843	14 55 1.4	55.17	22 4.0
5	2 58 30.85	11.887	15 16 55.3	54.31	22 4.8
6	3 3 16.66	+11.931	+15 38 28.2	+53.42	22 5.6
7	3 8 3.53	11.975	15 59 39.2	52.50	22 6.5
8	3 12 51.48	12.020	16 20 27.8	51.54	22 7.4
9	3 17 40.51	12.066	16 40 53.1	50.56	22 8.3
10	3 22 30.64	12.112	17 0 54.6	49.55	22 9.2
11	3 27 21.87	+12.158	+17 20 31.6	+48.52	22 10.1
12	3 32 14.21	12.204	17 39 43.3	47.45	22 11.0
13	3 37 7.65	12.250	17 58 29.2	46.36	22 12.0
14	3 42 2.19	12.296	18 16 48.4	45.23	22 13.0
15	3 46 57.84	12.342	18 34 40.3	44.08	22 14.0
16	3 51 54.59	+12.388	+18 52 4.3	+42.91	22 15.0
17	3 56 52.45	12.434	19 8 59.8	41.71	22 16.1
18	4 1 51.40	12.479	19 25 26.1	40.48	22 17.1
19	4 6 51.43	12.524	19 41 22.5	39.22	22 18.2
20	4 11 52.56	12.569	19 56 48.5	37.94	22 19.3
21	4 16 54.76	+12.614	+20 11 43.5	+36.64	22 20.4
22	4 21 58.02	12.658	20 26 6.8	35.31	22 21.5
23	4 27 2.32	12.701	20 39 57.8	33.95	22 22.7
24	4 32 7.64	12.743	20 53 16.1	32.57	22 23.8
25	4 37 13.95	12.784	21 6 1.1	31.17	22 25.0
26	4 42 21.24	+12.824	+21 18 12.1	+29.75	22 26.2
27	4 47 29.48	12.863	21 29 48.7	28.30	22 27.4
28	4 52 38.66	12.901	21 40 50.2	26.83	22 28.6
29	4 57 48.73	12.937	21 51 16.2	25.34	22 29.8
30	5 2 59.66	12.972	22 1 6.2	23.83	22 31.0
31	5 8 11.41	+13.006	+22 10 19.8	+22.30	22 32.3
32	5 13 23.94	+13.038	+22 18 56.4	+20.75	22 33.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	6″.9	6″.7	6″.6	6″.4	6″.3	6″.2	6″.0
Hor. Parallax . .	7.2	7.0	6.8	6.6	6.5	6.4	6.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	5″.9	5″.8	5″.7	5″.6	5″.5	5″.5
Hor. Parallax . .	6.1	6.0	5.9	5.8	5.7	5.6

Note.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 8 11.41	+13.006	+22 10 19.8	+22.30	22 32.3	1	7 51 42.92	+13.035	+21 31 11.6	−28.78	23 13.7
2	5 13 23.94	13.036	22 18 56.4	20.75	22 33.6	2	7 56 55.40	13.004	21 19 22.2	30.34	23 14.9
3	5 18 37.21	13.066	22 26 55.6	19.18	22 34.9	3	8 2 7.12	12.972	21 6 55.5	31.88	23 16.2
4	5 23 51.18	13.096	22 34 17.0	17.60	22 36.2	4	8 7 18.04	12.938	20 53 52.0	33.41	23 17.4
5	5 29 5.80	13.122	22 41 0.2	16.00	22 37.5	5	8 12 28.13	12.903	20 40 12.0	34.92	23 18.6
6	5 34 21.03	+13.146	+22 47 5.0	+14.39	22 38.8	6	8 17 37.37	+12.867	+20 25 56.0	−36.41	23 19.8
7	5 39 36.82	13.168	22 52 30.9	12.77	22 40.2	7	8 22 45.72	12.830	20 11 4.6	37.88	23 21.0
8	5 44 53.12	13.189	22 57 17.7	11.13	22 41.5	8	8 27 53.17	12.791	19 55 38.3	39.32	23 22.2
9	5 50 9.88	13.207	23 1 25.1	9.48	22 42.9	9	8 32 59.68	12.751	19 39 37.6	40.74	23 23.4
10	5 55 27.04	13.223	23 4 52.8	7.82	22 44.2	10	8 38 5.22	12.711	19 23 3.0	42.14	23 24.5
11	6 0 44.56	+13.237	+23 7 40.4	+ 6.14	22 45.6	11	8 43 9.79	+12.670	+19 5 55.1	−43.52	23 25.6
12	6 6 2.38	13.248	23 9 48.0	4.48	22 46.9	12	8 48 13.37	12.628	18 48 14.4	44.87	23 26.7
13	6 11 20.45	13.257	23 11 15.4	2.80	22 48.3	13	8 53 15.94	12.586	18 30 1.6	46.19	23 27.8
14	6 16 38.72	13.264	23 12 2.4	+ 1.11	22 49.7	14	8 58 17.50	12.543	18 11 17.3	47.49	23 28.8
15	6 21 57.13	13.269	23 12 8.8	− 0.58	22 51.1	15	9 3 18.02	12.501	17 52 2.1	48.77	23 29.9
16	6 27 15.63	+13.272	+23 11 34.6	− 2.27	22 52.5	16	9 8 17.52	+12.458	+17 32 16.6	−50.02	23 30.9
17	6 32 34.18	13.273	23 10 19.7	3.97	22 53.8	17	9 13 15.98	12.415	17 12 1.4	51.24	23 31.9
18	6 37 52.71	13.271	23 8 24.2	5.66	22 55.2	18	9 18 13.41	12.372	16 51 17.2	52.44	23 32.9
19	6 43 11.19	13.267	23 5 48.2	7.35	22 56.5	19	9 23 9.82	12.329	16 30 4.6	53.61	23 33.9
20	6 48 29.54	13.261	23 2 31.4	9.04	22 57.9	20	9 28 5.20	12.286	16 8 24.3	54.75	23 34.9
21	6 53 47.72	+13.253	+22 58 34.1	−10.73	22 59.2	21	9 32 59.56	+12.244	+15 46 17.0	−55.86	23 35.8
22	6 59 5.69	13.243	22 53 56.3	12.41	23 0.6	22	9 37 52.91	12.202	15 23 43.1	56.95	23 36.8
23	7 4 23.39	13.231	22 48 38.2	14.09	23 1.9	23	9 42 45.26	12.160	15 0 43.6	58.01	23 37.7
24	7 9 40.78	13.217	22 42 39.9	15.76	23 3.3	24	9 47 36.61	12.119	14 37 19.0	59.04	23 38.6
25	7 14 57.81	13.201	22 36 1.6	17.43	23 4.6	25	9 52 26.99	12.079	14 13 30.1	60.04	23 39.5
26	7 20 14.42	+13.183	+22 28 43.4	−19.08	23 5.9	26	9 57 16.41	+12.039	+13 49 17.4	−61.01	23 40.3
27	7 25 30.58	13.163	22 20 45.5	20.73	23 7.2	27	10 2 4.89	12.000	13 24 41.8	61.95	23 41.2
28	7 30 46.23	13.141	22 12 8.3	22.36	23 8.5	28	10 6 52.44	11.962	12 59 44.0	62.86	23 42.0
29	7 36 1.34	13.117	22 2 52.0	23.99	23 9.8	29	10 11 39.08	11.925	12 34 24.5	63.74	23 42.8
30	7 41 15.85	13.091	21 52 56.9	25.60	23 11.1	30	10 16 24.82	11.888	12 8 44.1	64.60	23 43.6
31	7 46 29.72	+13.064	+21 42 23.3	−27.20	23 12.4	31	10 21 9.68	+11.850	+11 42 43.6	−65.42	23 44.4
32	7 51 42.92	+13.035	+21 31 11.6	−28.78	23 13.7	32	10 25 53.70	+11.817	+11 16 23.6	−66.22	23 45.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	5″.4	5″.3	5″.3	5″.2	5″.2	5″.1	Semidiameter . .	5″.1	5″.1	5″.0	5″.0	5″.0	5″.0
Hor. Parallax .	5.6	5.5	5.5	5.4	5.4	5.3	Hor. Parallax . .	5.3	5.2	5.2	5.2	5.2	5.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 25 53.70	+11.817	+11 16 23.6	−66.22	23 45.2	1	12 43 55.50	+11.430	− 3 23 23.3	−75.85	0 4.2
2	10 30 36.90	11.783	10 49 45.0	66.99	23 46.0	2	12 48 29.97	11.443	3 53 41.8	75.70	0 4.9
3	10 35 19.29	11.750	10 22 48.4	67.72	23 46.7	3	12 53 4.78	11.458	4 23 56.2	75.51	0 5.5
4	10 40 0.91	11.719	9 55 34.7	68.42	23 47.5	4	12 57 39.96	11.475	4 54 5.8	75.29	0 6.1
5	10 44 41.78	11.688	9 28 4.4	69.09	23 48.2	5	13 2 15.55	11.493	5 24 9.8	75.04	0 6.8
6	10 49 21.92	+11.658	+ 9 0 18.5	−69.73	23 48.9	6	13 6 51.59	+11.513	− 5 54 7.4	−74.76	0 7.4
7	10 54 1.38	11.630	8 32 17.6	70.34	23 49.6	7	13 11 28.14	11.534	6 23 57.8	74.44	0 8.1
8	10 58 40.17	11.603	8 4 2.4	70.92	23 50.3	8	13 16 5.21	11.557	6 53 40.2	74.09	0 8.8
9	11 3 18.33	11.577	7 35 33.7	71.47	23 51.0	9	13 20 42.85	11.581	7 23 13.9	73.71	0 9.5
10	11 7 55.89	11.553	7 6 52.2	71.99	23 51.7	10	13 25 21.10	11.607	7 52 38.0	73.30	0 10.2
11	11 12 32.88	+11.530	+ 6 37 58.7	−72.47	23 52.3	11	13 29 59.98	+11.635	− 8 21 51.8	−72.85	0 10.9
12	11 17 9.35	11.509	6 8 53.9	72.92	23 53.0	12	13 34 39.56	11.665	8 50 54.6	72.37	0 11.6
13	11 21 45.34	11.489	5 39 38.5	73.35	23 53.6	13	13 39 19.88	11.696	9 19 45.5	71.86	0 12.3
14	11 26 20.87	11.471	5 10 13.2	73.74	23 54.3	14	13 44 0.96	11.729	9 48 23.7	71.32	0 13.1
15	11 30 55.99	11.455	4 40 38.7	74.11	23 54.9	15	13 48 42.82	11.763	10 16 48.4	70.74	0 13.9
16	11 35 30.73	+11.441	+ 4 10 55.9	−74.45	23 55.6	16	13 53 25.53	+11.798	−10 44 59.1	−70.14	0 14.6
17	11 40 5.14	11.428	3 41 5.5	74.75	23 56.2	17	13 58 9.11	11.835	11 12 54.8	69.50	0 15.4
18	11 44 39.25	11.417	3 11 8.1	75.02	23 56.8	18	14 2 53.59	11.873	11 40 34.9	68.83	0 16.2
19	11 49 13.12	11.407	2 41 4.5	75.27	23 57.4	19	14 7 39.01	11.913	12 7 58.4	68.13	0 17.0
20	11 53 46.78	11.399	2 10 55.3	75.48	23 58.0	20	14 12 25.41	11.954	12 35 4.7	67.39	0 17.8
21	11 58 20.28	+11.393	+ 1 40 41.3	−75.68	23 58.6	21	14 17 12.82	+11.997	−13 1 52.8	−66.62	0 18.6
22	12 2 53.66	11.388	1 10 23.2	75.83	23 59.2	22	14 22 1.26	12.040	13 28 22.1	65.82	0 19.5
23	12 7 26.95	11.386	0 40 1.7	75.96	23 59.9	23	14 26 50.76	12.085	13 54 31.7	64.98	0 20.4
24	12 12 0.20	11.386	+ 0 9 37.5	76.06		24	14 31 41.36	12.131	14 20 20.9	64.11	0 21.3
25	12 16 33.46	11.387	− 0 20 48.6	76.12	0 0.5	25	14 36 33.08	12.178	14 45 48.8	63.21	0 22.2
26	12 21 6.77	+11.390	− 0 51 15.8	−76.15	0 1.1	26	14 41 25.93	+12.226	−15 10 54.7	−62.27	0 23.2
27	12 25 40.18	11.394	1 21 43.4	76.15	0 1.7	27	14 46 19.94	12.275	15 35 37.7	61.30	0 24.1
28	12 30 13.71	11.400	1 52 10.7	76.12	0 2.4	28	14 51 15.13	12.325	15 59 57.0	60.30	0 25.1
29	12 34 47.41	11.408	2 22 37.0	76.06	0 3.0	29	14 56 11.52	12.375	16 23 51.9	59.26	0 26.1
30	12 39 21.33	11.418	2 53 1.4	75.97	0 3.6	30	15 1 9.12	12.426	16 47 21.5	58.19	0 27.1
31	12 43 55.50	+11.430	− 3 23 23.3	−75.85	0 4.2	31	15 6 7.94	+12.477	−17 10 25.0	−57.09	0 28.2
32	12 48 29.97	+11.443	− 3 53 41.8	−75.70	0 4.9	32	15 11 7.99	+12.528	−17 33 1.6	−55.95	0 29.2

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.0	5″.0	Semidiameter . .	5″.0	5″.0	5″.0	5″.0	5″.1	5″.1
Hor. Parallax . .	5.1	5.1	5.1	5.1	5.1	5.2	Hor. Parallax . .	5.2	5.2	5.2	5.2	5.2	5.3

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 11 7.99	+12.528	−17 33 1.6	−55.95	0 29.2
2	15 16 9.27	12.579	17 55 10.5	54.78	0 30.3
3	15 21 11.80	12.631	18 16 50.8	53.59	0 31.4
4	15 26 15.57	12.683	18 38 1.8	52.34	0 32.5
5	15 31 20.58	12.735	18 58 42.7	51.07	0 33.7
6	15 36 26.83	+12.786	−19 18 52.8	−49.77	0 34.8
7	15 41 34.31	12.837	19 38 31.2	48.44	0 36.0
8	15 46 43.01	12.888	19 57 37.2	47.07	0 37.2
9	15 51 52.92	12.938	20 16 10.1	45 67	0 38.4
10	15 57 4.04	12.988	20 34 9.2	44.25	0 39.6
11	16 2 16.34	+13.037	−20 51 33.7	−42.79	0 40.9
12	16 7 29.82	13.086	21 8 22.8	41.31	0 42.2
13	16 12 44.44	13.133	21 24 35.9	39.79	0 43.5
14	16 18 0.18	13.179	21 40 12.4	38.25	0 44.8
15	16 23 17.03	13.225	21 55 11.6	36.68	0 46.2
16	16 28 34.95	+13.269	−22 9 32.9	−35.09	0 47.5
17	16 33 53.92	13.312	22 23 15.6	33.47	0 48.9
18	16 39 13.91	13.353	22 36 19.3	31.83	0 50.3
19	16 44 34.87	13.393	22 48 43.3	30.17	0 51.7
20	16 49 56.77	13.432	23 0 27.1	28.48	0 53.1
21	16 55 19.57	+13.469	−23 11 30.0	−26.76	0 54.6
22	17 0 43.23	13.504	23 21 51.6	25.03	0 56.0
23	17 6 7.70	13.537	23 31 31.5	23.28	0 57.5
24	17 11 32.94	13.567	23 40 29.1	21.51	0 59 0
25	17 16 58.88	13.595	23 48 44.1	19.73	1 0.5
26	17 22 25.47	+13.621	−23 56 16.0	−17.93	1 2.0
27	17 27 52.67	13.645	24 3 4.5	16.11	1 3.5
28	17 33 20.40	13.666	24 9 9.3	14.28	1 5.0
29	17 38 48.61	13.684	24 14 29.9	12.43	1 6.5
30	17 44 17.23	13.700	24 19 6.2	10.56	1 8.0
31	17 49 46.20	+13.713	−24 22 57.8	− 8.72	1 9.6
32	17 55 15.44	+13.723	−24 26 4.7	− 6.85	1 11.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	5.1	5.2	5.2	5.2	5.3	5.3
Hor. Parallax . . .	5.3	5.3	5.4	5.4	5.5	5.5

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 49 46.20	+13.713	−24 22 57.8	− 8.72	1 9.6
2	17 55 15.44	13.723	24 26 4.7	6.85	1 11.1
3	18 0 44.90	13.730	24 28 26.5	4.97	1 12.7
4	18 6 14.50	13.735	24 30 3.2	3.08	1 14.2
5	18 11 44.17	13.736	24 30 54.6	− 1.20	1 15.8
6	18 17 13.85	+13.735	−24 31 0.7	+ 0.69	1 17.3
7	18 22 43.45	13.731	24 30 21.6	2.58	1 18.9
8	18 28 12 92	13.724	24 28 57.0	4.46	1 20.4
9	18 33 42.17	13.714	24 26 47.1	6.34	1 22.0
10	18 39 11.14	13.701	24 23 52.2	8.22	1 23.5
11	18 44 39.77	+13.685	−24 20 12.4	+10.10	1 25.1
12	18 50 7.99	13.667	24 15 47.6	11.97	1 26 6
13	18 55 35.74	13.646	24 10 38.1	13.83	1 28.2
14	19 1 2.94	13.623	24 4 44.2	15.67	1 29.7
15	19 6 29.55	13 597	23 58 6.1	17.51	1 31.2
16	19 11 55.52	+13.568	−23 50 44.1	+19.33	1 32.7
17	19 17 20.77	13.537	23 42 38.5	21.14	1 34.1
18	19 22 45.25	13.504	23 33 49.6	22.93	1 35.6
19	19 28 8.91	13.469	23 24 17.8	24.71	1 37.0
20	19 33 31.72	13.432	23 14 3.5	26.47	1 38.5
21	19 38 53.60	+13.393	−23 3 7.2	+28.21	1 39.9
22	19 44 14.51	13.351	22 51 29.4	29.93	1 41.3
23	19 49 34.41	13.308	22 39 10.6	31.63	1 42.7
24	19 54 53.25	13.263	22 26 11.2	33.31	1 44.1
25	20 0 11.01	13.217	22 12 31.7	34.97	1 45.4
26	20 5 27.65	+13.169	−21 58 12.8	+36.60	1 46.8
27	20 10 43.12	13.120	21 43 15.0	38.21	1 48.1
28	20 15 57.38	13.069	21 27 38.9	39.79	1 49.4
29	20 21 10.41	13.017	21 11 25.1	41.35	1 50.7
30	20 26 22.19	12.964	20 54 34.3	42.88	1 51.9
31	20 31 32.69	+12.910	−20 37 7.1	+44.38	1 53.1
32	20 36 41.88	+12.855	−20 19 4.4	+45.85	1 54.3

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . .	5.4	5.4	5.5	5.6	5.6	5.7	5.8
Hor. Parallax . .	5.6	5.6	5.7	5 8	5.8	5.9	6.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 53 13.94	+6.910	−7 58 54.1	+45.23	4 9.6
2	22 55 59.65	6.900	7 40 46.9	45.36	4 8.5
3	22 58 45.12	6.889	7 22 36.6	45.48	4 7.3
4	23 1 30.33	6.879	7 4 23.5	45.60	4 6.1
5	23 4 15.31	6.870	6 46 7.6	45.71	4 4.9
6	23 7 0.07	+6.861	−6 27 49.1	+45.82	4 3.7
7	23 9 44.61	6.852	6 9 28.2	45.92	4 2.5
8	23 12 28 95	6.843	5 51 5.0	46.01	4 1.3
9	23 15 13.08	6.835	5 32 39.7	46.10	4 0.1
10	23 17 57.01	6.827	5 14 12.5	46.18	3 58.9
11	23 20 40.75	+6.819	−4 55 43.5	+46.25	3 57.7
12	23 23 24.30	6.811	4 37 13.0	46.31	3 56.5
13	23 26 7.66	6.803	4 18 41.2	46.36	3 55.2
14	23 28 50.84	6.796	4 0 8.1	46.40	3 54.0
15	23 31 33.85	6.789	3 41 34.0	46.44	3 52.7
16	23 34 16.69	+6 782	−3 22 59.2	+46.47	3 51.5
17	23 36 59.37	6.775	3 4 23.7	46.49	3 50.3
18	23 39 41.88	6.768	2 45 47.7	46.50	3 49.1
19	23 42 24.24	6.762	2 27 11.4	46.50	3 47.9
20	23 45 6.45	6.756	2 8 35.0	46.50	3 46.6
21	23 47 48.51	+6.750	−1 49 58.8	+46.50	3 45.4
22	23 50 30.43	6.744	1 31 22.8	46.49	3 44.1
23	23 53 12.23	6.739	1 12 47.2	46.47	3 42.9
24	23 55 53.90	6.734	0 54 12.2	46.44	3 41.6
25	23 58 35.46	6.729	0 35 38.0	46.41	3 40.4
26	0 1 16.90	+6.725	−0 17 4.7	+46.37	3 39.1
27	0 3 58.24	6.721	+0 1 27.5	46.33	3 37.9
28	0 6 39.51	6.718	0 19 58.6	46.28	3 36.6
29	0 9 20.69	6.715	0 38 28.4	46.22	3 35.4
30	0 12 1.80	6.712	0 56 56.6	46.15	3 34.1
31	0 14 42.85	+6.709	+1 15 23.3	+46.07	3 32.9
32	0 17 23.86	+6.707	+1 33 48.1	+45.99	3 31.6

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 17 23.86	+6.707	+ 1 33 48.1	+45.99	3 31.6
2	0 20 4.81	6.706	1 52 11.0	45.91	3 30.4
3	0 22 45.73	6.705	2 10 31.9	45.82	3 29.1
4	0 25 26.63	6.704	2 28 50.6	45.72	3 27.9
5	0 28 7.50	6.704	2 47 7.0	45.62	3 26.6
6	0 30 48.36	+6.703	+ 3 5 20.9	+45.52	3 25.3
7	0 33 29.21	6.703	3 23 32.1	45.41	3 24.1
8	0 36 10.07	6.703	3 41 40.5	45.29	3 22.8
9	0 38 50.94	6.703	3 59 46.0	45.16	3 21.6
10	0 41 31.82	6.704	4 17 48.5	45.03	3 20.3
11	0 44 12.72	+6.705	+ 4 35 47.7	+44.89	3 19.0
12	0 46 53.64	6.706	4 53 43.4	44.75	3 17.8
13	0 49 34.58	6.707	5 11 35.6	44.60	3 16.5
14	0 52 15.55	6.708	5 29 24.0	44.44	3 15.3
15	0 54 56.56	6.710	5 47 8.6	44.27	3 14.0
16	0 57 37.61	+6.712	+ 6 4 49.0	+44.09	3 12.7
17	1 0 18.70	6.714	6 22 25.3	43.91	3 11.5
18	1 2 59.85	6.716	6 39 57.3	43.73	3 10.2
19	1 5 41.06	6.718	6 57 24.7	43.54	3 9.0
20	1 8 22.33	6.721	7 14 47.5	43.35	3 7.7
21	1 11 3.66	+6.724	+ 7 32 5.5	+43.15	3 6.4
22	1 13 45.06	6.727	7 49 18.5	42.94	3 5.2
23	1 16 26.55	6.730	8 6 26.5	42.72	3 3.9
24	1 19 8.12	6.734	8 23 29.3	42.50	3 2.7
25	1 21 49.79	6.738	8 40 26.8	42.28	3 1.4
26	1 24 31.57	+6.743	+ 8 57 18.9	+42.05	3 0.2
27	1 27 13.46	6.748	9 14 5.4	41.81	2 58.9
28	1 29 55.47	6.753	9 30 46.2	41.57	2 57.7
29	1 32 37.60	6.759	9 47 21.3	41.33	2 56.4
30	1 35 19.86	6.765	10 3 50.4	41.09	2 55.2
31	1 38 2.27	+6.770	+10 20 13.5	+40.84	2 53.9
32	1 40 44.82	+6.776	+10 36 30.4	+40.58	2 52.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	3″.1	3″.1	3″.0	3″.0	2″.9	2″.9	2″.8
Hor. Parallax . .	5.5	5.4	5.3	5.2	5.1	5.0	4.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.
Semidiameter.	2″.8	2″.7	2″.7	2″.6	2″.6
Hor. Parallax	4.8	4.7	4.6	4.5	4.4

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	MARCH.						APRIL.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 32 37.60	+6.759	+ 9 47 21.3	+41.33	2 56.4	1	2 57 48.74	+6.999	+17 22 16.9	+31.24	2 19.5
2	1 35 19.86	6.765	10 3 50.4	41.09	2 55.2	2	3 0 36.82	7.008	17 34 42.0	30.84	2 18.3
3	1 38 2.27	6.770	10 20 13.5	40.84	2 53.9	3	3 3 25.13	7.017	17 46 57.5	30.44	2 17.2
4	1 40 44.82	6.776	10 36 30.4	40.58	2 52.7	4	3 6 13.67	7.027	17 59 3.2	30.03	2 16.0
5	1 43 27.51	6.782	10 52 41.1	40.32	2 51.5	5	3 9 2.43	7.036	18 10 59.2	29.62	2 14.9
6	1 46 10.37	+6.789	+11 8 45.3	+40.05	2 50.3	6	3 11 51.42	+7.046	+18 22 45.3	+29.21	2 13.8
7	1 48 53.39	6.796	11 24 43.1	39.77	2 49.1	7	3 14 40.63	7.055	18 34 21.4	28.80	2 12.6
8	1 51 36.57	6.803	11 40 34.3	39.49	2 47.8	8	3 17 30.07	7.064	18 45 47.5	28.38	2 11.5
9	1 54 19.92	6.810	11 56 18.6	39.20	2 46.6	9	3 20 19.73	7.074	18 57 3.3	27.95	2 10.4
10	1 57 3.44	6.817	12 11 56.0	38.91	2 45.4	10	3 23 9.60	7.083	19 8 8.9	27.52	2 9.3
11	1 59 47.14	+6.824	+12 27 26.4	+38.62	2 44.2	11	3 25 59.69	+7.092	+19 19 4.1	+27.09	2 8.2
12	2 2 31.02	6.831	12 42 49.6	38.32	2 43.0	12	3 28 49.98	7.101	19 29 48.8	26.65	2 7.1
13	2 5 15.07	6.839	12 58 5.6	38.01	2 41.8	13	3 31 40.48	7.109	19 40 23.0	26.21	2 6.0
14	2 7 59.30	6.847	13 13 14.1	37.70	2 40.6	14	3 34 31.19	7.117	19 50 46.5	25.76	2 4.9
15	2 10 43.72	6.854	13 28 15.1	37.38	2 39.4	15	3 37 22.09	7.125	20 0 59.2	25.31	2 3.8
16	2 13 28.33	+6.862	+13 43 8.3	+37.05	2 38.2	16	3 40 13.19	+7.133	+20 11 1.1	+24.86	2 2.8
17	2 16 13.12	6.870	13 57 53.7	36.72	2 37.0	17	3 43 4.48	7.141	20 20 52.1	24.40	2 1.7
18	2 18 58.09	6.878	14 12 31.1	36.39	2 35.8	18	3 45 55.96	7.149	20 30 32.1	23.94	2 0.6
19	2 21 43.25	6.886	14 27 0.5	36.06	2 34.6	19	3 48 47.62	7.157	20 40 1.0	23.48	1 59.5
20	2 24 28.61	6.894	14 41 21.7	35.72	2 33.4	20	3 51 39.46	7.164	20 49 18.8	23.01	1 58.4
21	2 27 14.16	+6.902	+14 55 34.5	+35.37	2 32.3	21	3 54 31.48	+7.171	+20 58 25.3	+22.54	1 57.4
22	2 29 59.91	6.910	15 9 39.0	35.01	2 31.1	22	3 57 23.67	7.178	21 7 20.6	22.07	1 56.3
23	2 32 45.85	6.919	15 23 34.9	34.65	2 29.9	23	4 0 16.03	7.185	21 16 4.6	21.59	1 55.2
24	2 35 31.99	6.927	15 37 22.1	34.29	2 28.7	24	4 3 8.57	7.192	21 24 37.1	21.11	1 54.1
25	2 38 18.34	6.935	15 51 0.6	33.92	2 27.5	25	4 6 1.27	7.199	21 32 58.2	20.63	1 53.1
26	2 41 4.89	+6.944	+16 4 30.2	+33.55	2 26.3	26	4 8 54.13	+7.206	+21 41 7.7	+20.15	1 52.0
27	2 43 51.65	6.953	16 17 50.9	33.18	2 25.2	27	4 11 47.15	7.213	21 49 5.6	19.67	1 51.0
28	2 46 38.63	6.962	16 31 2.5	32.80	2 24.1	28	4 14 40.33	7.219	21 56 52.0	19.19	1 49.9
29	2 49 25.82	6.971	16 44 5.0	32.41	2 23.0	29	4 17 33.67	7.226	22 4 26.8	18.70	1 48.9
30	2 52 13.24	6.980	16 56 58.3	32.02	2 21.8	30	4 20 27.16	7.232	22 11 49.8	18.21	1 47.8
31	2 55 0.88	+6.990	+17 9 42.3	+31.63	2 20.6	31	4 23 20.79	+7.238	+22 19 1.0	+17.72	1 46.8
32	2 57 48.74	+6.999	+17 22 16.9	+31.24	2 19.5	32	4 26 14.56	+7.244	+22 26 0.4	+17.23	1 45.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	2″.5	2″.5	2″.4	2″.4	2″.3	2″.3
Hor. Parallax	4.4	4.3	4.2	4.2	4.1	4.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter	2″.3	2″.2	2″.2	2″.2	2″.2	2″.1	2″.1
Hor. Parallax	4.0	4.0	3.9	3.9	3.8	3.8	3.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	4 23 20.79	+7.238	+22 19 1.0	+17.72	1 46.8
2	4 26 14.56	7.244	22 26 0.4	17.23	1 45.7
3	4 29 8.47	7.249	22 32 48.0	16.74	1 44.7
4	4 32 2.51	7.254	22 39 23.6	16.25	1 43.7
5	4 34 56.67	7.259	22 45 47.3	15.76	1 42.6
6	4 37 50.96	+7.264	+22 51 59.0	+15.27	1 41.6
7	4 40 45.35	7.268	22 57 58.6	14.78	1 40.6
8	4 43 39.85	7.272	23 3 46.2	14.27	1 39.5
9	4 46 34.44	7.276	23 9 21.6	13.76	1 38.5
10	4 49 29.11	7.280	23 14 44.9	13.24	1 37.5
11	4 52 23.86	+7.283	+23 19 55.9	+12.72	1 36.4
12	4 55 18.67	7.285	23 24 54.7	12.20	1 35.4
13	4 58 13.55	7.287	23 29 41.3	11.69	1 34.4
14	5 1 8.47	7.289	23 34 15.6	11.17	1 33.3
15	5 4 3.43	7.291	23 38 37.5	10.66	1 32.3
16	5 6 58.43	+7.292	+23 42 47.1	+10.14	1 31.3
17	5 9 53.45	7.292	23 46 44.3	9.63	1 30.2
18	5 12 48.49	7.293	23 50 29.1	9.11	1 29.2
19	5 15 43.53	7.293	23 54 1.5	8.60	1 28.1
20	5 18 38.57	7.293	23 57 21.6	8.08	1 27.1
21	5 21 33.60	+7.292	+24 0 29.3	+7.56	1 26.1
22	5 24 28.62	7.292	24 3 24.5	7.04	1 25.0
23	5 27 23.62	7.291	24 6 7.3	6.52	1 24.0
24	5 30 18.59	7.290	24 8 37.8	6.00	1 23.0
25	5 33 13.54	7.289	24 10 56.0	5.49	1 22.0
26	5 36 8.44	+7.287	+24 13 1.7	+4.98	1 21.0
27	5 39 3.30	7.285	24 14 55.1	4.47	1 20.0
28	5 41 58.11	7.283	24 16 36.1	3.95	1 19.0
29	5 44 52.85	7.280	24 18 4.8	3.44	1 18.0
30	5 47 47.53	7.277	24 19 21.1	2.93	1 16.9
31	5 50 42.14	+7.274	+24 20 25.1	+2.41	1 15.9
32	5 53 36.67	+7.270	+24 21 16.8	+1.90	1 14.9

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
Semidiameter . .	2″.1	2″.1	2″.1	2″.1	2″.0	2″.0	2″.0
Hor Parallax . .	3.7	3.7	3.6	3.6	3.6	3.5	3.5

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 53 36.67	+7.270	+24 21 16.8	+ 1.90	1 14.9
2	5 56 31.11	7.266	24 21 56.3	1.39	1 13.8
3	5 59 25.46	7.262	24 22 23.5	0.88	1 12.8
4	6 2 19.70	7.257	24 22 38.4	+ 0.37	1 11.7
5	6 5 13.82	7.252	24 22 41.2	− 0.14	1 10.7
6	6 8 7.81	+7.246	+24 22 31.7	− 0.65	1 9.6
7	6 11 1.68	7.240	24 22 10.1	1.16	1 8.5
8	6 13 55.40	7.234	24 21 36.4	1.66	1 7.5
9	6 16 48.96	7.228	24 20 50.6	2.16	1 6.4
10	6 19 42.34	7.221	24 19 52.7	2.66	1 5.4
11	6 22 35.58	+7.214	+24 18 42.8	− 3.16	1 4.3
12	6 25 28.63	7.206	24 17 20.9	3.66	1 3.3
13	6 28 21.48	7.198	24 15 47.1	4.16	1 2.2
14	6 31 14.13	7.190	24 14 1.4	4.65	1 1.2
15	6 34 6.58	7.181	24 12 3.9	5.14	1 0.1
16	6 36 58.81	+7.172	+24 9 54.6	− 5.63	0 59.1
17	6 39 50.82	7.163	24 7 33.6	6.12	0 58.0
18	6 42 42.60	7.153	24 5 0.9	6.61	0 56.9
19	6 45 34.15	7.143	24 2 16.6	7.09	0 55.8
20	6 48 25.46	7.133	23 59 20.8	7.57	0 54.7
21	6 51 16.52	+7.122	+23 56 13.5	− 8.05	0 53.6
22	6 54 7.33	7.112	23 52 54.7	8.52	0 52.5
23	6 56 57.89	7.101	23 49 24.6	8.99	0 51.4
24	6 59 48.19	7.090	23 45 43.2	9.46	0 50.3
25	7 2 38.23	7.079	23 41 50.6	9.93	0 49.2
26	7 5 28.00	+7.068	+23 37 46.8	−10.39	0 48.1
27	7 8 17.50	7.057	23 33 31.9	10.85	0 47.0
28	7 11 6.72	7.046	23 29 5.9	11.31	0 45.9
29	7 13 55.67	7.034	23 24 29.0	11.77	0 44.8
30	7 16 44.34	7.022	23 19 41.2	12.22	0 43.6
31	7 19 32.71	+7.010	+23 14 42.6	−12.67	0 42.5
32	7 22 20.78	+6.997	+23 9 33.2	−13.11	0 41.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter . .	2″.0	2″.0	2″.0	2″.0	1″.9	1″.9
Hor. Parallax . .	3.5	3.5	3.4	3.4	3.4	3.4

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 19 32.71	+7.010	+23 14 42.6	−12.67	0 42.5	1	8 43 44.56	+6.559	+19 18 44.0	−24.78	0 4.5
2	7 22 20.78	6.997	23 9 33.2	13.11	0 41.4	2	8 46 21.81	6.544	19 8 45.3	25.11	0 3.2
3	7 25 8.55	6.984	23 4 13.2	13.55	0 40.2	3	8 48 58.70	6.529	18 58 38.7	25.43	0 1.9
4	7 27 56.02	6.971	22 58 42.6	13.99	0 39.1	4	8 51 35.22	6.514	18 48 24.4	25.75	{ 0 0.5 { 23 59.2
5	7 30 43.17	6.958	22 53 1.5	14.43	0 37.9	5	8 54 11.38	6.499	18 38 2.4	26.07	23 57.9
6	7 33 30.01	+6.945	+22 47 9.9	−14.86	0 36.8	6	8 56 47.18	+6.484	+18 27 32.9	−26.38	23 56.6
7	7 36 16.52	6.931	22 41 8.0	15.29	0 35.6	7	8 59 22.61	6.469	18 16 56.0	26.69	23 55.2
8	7 39 2.70	6.917	22 34 55.8	15.71	0 34.4	8	9 1 57.68	6.454	18 6 11.9	26.99	23 53.8
9	7 41 48.55	6.903	22 28 33.5	16.13	0 33.2	9	9 4 32.38	6.439	17 55 20.5	27.29	23 52.5
10	7 44 34.05	6.889	22 22 1.0	16.55	0 32.0	10	9 7 6.72	6.424	17 44 22.1	27.58	23 51.1
11	7 47 19.21	+6.875	+22 15 18.6	−16.97	0 30.8	11	9 9 40.71	+6.409	+17 33 16.6	−27.87	23 49.7
12	7 50 4.02	6.860	22 8 26.3	17.38	0 29.6	12	9 12 14.34	6.394	17 22 4.3	28.15	23 48.3
13	7 52 48.48	6.845	22 1 24.2	17.79	0 28.4	13	9 14 47.62	6.379	17 10 45.1	28.43	23 46.9
14	7 55 32.58	6.830	21 54 12.4	18.19	0 27.2	14	9 17 20.54	6.364	16 59 19.3	28.71	23 45.5
15	7 58 16.32	6.815	21 46 50.9	18.59	0 26.0	15	9 19 53.11	6.350	16 47 47.0	28.98	23 44.1
16	8 0 59.70	+6.800	+21 39 20.0	−18.99	0 24.8	16	9 22 25.34	+6.336	+16 36 8.2	−29.25	23 42.7
17	8 3 42.72	6.785	21 31 39.5	19.38	0 23.6	17	9 24 57.22	6.321	16 24 23.0	29.51	23 41.3
18	8 6 25.38	6.770	21 23 49.8	19.77	0 22.4	18	9 27 28.76	6.307	16 12 31.5	29.77	23 39.8
19	8 9 7.67	6.755	21 15 50.8	20.15	0 21.1	19	9 29 59.96	6.293	16 0 33.8	30.03	23 38.4
20	8 11 49.60	6.740	21 7 42.6	20.53	0 19.9	20	9 32 30.84	6.280	15 48 30.0	30.28	23 36.9
21	8 14 31.16	+6.724	+20 59 25.4	−20.90	0 18.6	21	9 35 1.40	+6.267	+15 36 20.2	−30.53	23 35.5
22	8 17 12.36	6.709	20 50 59.2	21.27	0 17.4	22	9 37 31.64	6.253	15 24 4.5	30.77	23 34.0
23	8 19 53.20	6.694	20 42 24.1	21.64	0 16.1	23	9 40 1.57	6.240	15 11 43.0	31.01	23 32.6
24	8 22 33.68	6.679	20 33 40.3	22.00	0 14.9	24	9 42 31.18	6.227	14 59 15.7	31.25	23 31.1
25	8 25 13.80	6.664	20 24 47.7	22.36	0 13.6	25	9 45 0.49	6.214	14 46 42.8	31.49	23 29.7
26	8 27 53.56	+6.649	+20 15 46.6	−22.72	0 12.3	26	9 47 29.49	+6.202	+14 34 4.4	−31.72	23 28.2
27	8 30 32.96	6.634	20 6 36.9	23.07	0 11.0	27	9 49 58.20	6.190	14 21 20.5	31.94	23 26.8
28	8 33 12.00	6.619	19 57 18.7	23.42	0 9.7	28	9 52 26.61	6.178	14 8 31.3	32.16	23 25.3
29	8 35 50.68	6.604	19 47 52.2	23.77	0 8.4	29	9 54 54.74	6.166	13 55 36.8	32.38	23 23.9
30	8 38 29.00	6.589	19 38 17.5	24.11	0 7.1	30	9 57 22.57	6.154	13 42 37.1	32.59	23 22.4
31	8 41 6.96	+6.574	+19 28 34.8	−24.45	0 5.8	31	9 59 50.12	+6.142	+13 29 32.4	−32.80	23 20.9
32	8 43 44.56	+6.559	+19 18 44.0	−24.78	0 4.5	32	10 2 17.39	+6.130	+13 16 22.8	−33.00	23 19.4

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter . .	1.″9	1.″9	1.″9	1.″9	1.″9	1.″9	Semidiameter . .	1.″9	1.″9	1.″9	1.″9	1.″9	1.″9
Hor. Parallax .	3.4	3.4	3.3	3.3	3.3	3.3	Hor. Parallax . .	3.3	3.3	3.3	3.3	3.3	3.3

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 2 17.39	+6.130	+13 16 22.8	−33.00	23 19.4	1	11 14 5.62	+5.871	+6 11 27.9	−37.24	22 32.9
2	10 4 44.38	6.119	13 3 8.3	33.20	23 17.9	2	11 16 26.47	5.866	5 56 33.2	37.33	22 31.3
3	10 7 11.10	6.107	12 49 49.1	33.40	23 16.4	3	11 18 47.20	5.861	5 41 36.6	37.41	22 29.7
4	10 9 37.55	6.096	12 36 25.2	33.59	23 14.9	4	11 21 7.81	5.856	5 26 38.2	37.49	22 28.1
5	10 12 3.72	6.085	12 22 56.8	33.78	23 13.4	5	11 23 28.30	5.852	5 11 38.1	37.56	22 26.5
6	10 14 29.62	+6.074	+12 9 24.0	−33.96	23 11.9	6	11 25 48.68	+5.847	+4 56 36.5	−37.63	22 24.9
7	10 16 55.26	6.063	11 55 46.9	34.14	23 10.3	7	11 28 8.95	5.842	4 41 33.4	37.67	22 23.3
8	10 19 20.64	6.052	11 42 5.6	34.31	23 8.8	8	11 30 29.12	5.838	4 26 28.9	37.72	22 21.7
9	10 21 45.77	6.041	11 28 20.2	34.48	23 7.3	9	11 32 49.20	5.834	4 11 23.1	37.76	22 20.1
10	10 24 10.65	6.031	11 14 30.8	34.64	23 5.8	10	11 35 9.18	5.831	3 56 16.2	37.81	22 18.5
11	10 26 35.28	+6.021	+11 0 37.5	−34.80	23 4.2	11	11 37 29.08	+5.828	+3 41 8.2	−37.85	22 16.9
12	10 28 59.67	6.011	10 46 40.4	34.96	23 2.7	12	11 39 48.90	5.825	3 25 59.2	37.89	22 15.2
13	10 31 23.82	6.001	10 32 39.5	35.11	23 1.1	13	11 42 8.66	5.822	3 10 49.2	37.93	22 13.6
14	10 33 47.75	5.992	10 18 35.0	35.26	22 59.6	14	11 44 28.35	5.819	2 55 38.3	37.97	22 12.0
15	10 36 11.45	5.983	10 4 26.9	35.41	22 58.0	15	11 46 47.98	5.817	2 40 26.7	38.00	22 10.4
16	10 38 34.94	+5.974	+ 9 50 15.4	−35.55	22 56.5	16	11 49 7.56	+5.815	+2 25 14.5	−38.02	22 8.8
17	10 40 58.22	5.966	9 36 0.6	35.69	22 54.9	17	11 51 27.10	5.813	2 10 1.6	38.04	22 7.2
18	10 43 21.29	5.958	9 21 42.5	35.82	22 53.3	18	11 53 46.60	5.812	1 54 48.3	38.06	22 5.6
19	10 45 44.17	5.950	9 7 21.1	35.95	22 51.8	19	11 56 6.07	5.811	1 39 34.5	38.08	22 4.0
20	10 48 6.86	5.942	8 52 56.7	36.08	22 50.2	20	11 58 25.52	5.810	1 24 20.3	38.10	22 2.4
21	10 50 29.37	+5.934	+ 8 38 29.2	−36.20	22 48.7	21	12 0 44.96	+5.810	+1 9 5.9	−38.11	22 0.7
22	10 52 51.70	5.927	8 23 58.8	36.32	22 47.1	22	12 3 4.40	5.810	0 53 51.2	38.12	21 59.1
23	10 55 13.86	5.920	8 9 25.6	36.44	22 45.6	23	12 5 23.82	5.810	0 38 36.5	38.12	21 57.5
24	10 57 35.85	5.913	7 54 49.6	36.56	22 44.0	24	12 7 43.25	5.810	0 23 21.7	38.11	21 55.9
25	10 59 57.69	5.906	7 40 10.9	36.67	22 42.4	25	12 10 2.69	5.811	+0 8 7.0	38.10	21 54.2
26	11 2 19.37	+5.900	+ 7 25 29.6	−36.77	22 40.8	26	12 12 22.14	+5.811	−0 7 7.5	−38.09	21 52.6
27	11 4 40.90	5.894	7 10 45.8	36.87	22 39.2	27	12 14 41.61	5.812	0 22 21.7	38.08	21 51.0
28	11 7 2.29	5.888	6 55 59.7	36.97	22 37.7	28	12 17 1.09	5.812	0 37 35.5	38.06	21 49.4
29	11 9 23.54	5.882	6 41 11.2	37.06	22 36.1	29	12 19 20.60	5.813	0 52 48.9	38.04	21 47.8
30	11 11 44.65	5.876	6 26 20.6	37.15	22 34.5	30	12 21 40.14	5.814	1 8 1.7	38.01	21 46.1
31	11 14 5.62	+5.871	+ 6 11 27.9	−37.24	22 32.9	31	12 23 59.71	+5.816	−1 23 13.8	−37.98	21 44.5
32	11 16 26.47	+5.866	+ 5 56 33.2	−37.33	22 31.3	32	12 26 19.32	+5.818	−1 38 25.1	−37.95	21 42.9

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	1″.9	1″.9	1″.9	1″.9	2″.0	2″.0	Semidiameter . .	2″.0	2″.0	2″.0	2″.0	2″.1	2″.1
Hor. Parallax . .	3.3	3.4	3.4	3.4	3.4	3.4	Hor. Parallax . .	3.5	3.5	3.5	3.6	3.6	3.6

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	12 26 19.32	+5.818	−1 38 25.1	−37.95	21 42.9
2	12 28 38.97	5.820	1 53 35.6	37.91	21 41.3
3	12 30 58.67	5.822	2 8 45.1	37.87	21 39.7
4	12 33 18.41	5.824	2 23 53.4	37.82	21 38.1
5	12 35 38.20	5.826	2 39 0.5	37.77	21 36.5
6	12 37 58.05	+5.828	−2 54 6.4	−37.71	21 34.9
7	12 40 17.97	5.831	3 9 10.9	37.65	21 33.2
8	12 42 37.95	5.834	3 24 13.8	37.59	21 31.6
9	12 44 58.00	5.837	3 39 15.2	37.52	21 30.0
10	12 47 18.13	5.841	3 54 15.0	37.45	21 28.4
11	12 49 38.35	+5.845	−4 9 13.0	−37.38	21 26.8
12	12 51 58.66	5.849	4 24 9.2	37.30	21 25.2
13	12 54 19.07	5.853	4 39 3.5	37.22	21 23.6
14	12 56 39.58	5.857	4 53 55.8	37.13	21 22.0
15	12 59 0.20	5.862	5 8 46.0	37.04	21 20.4
16	13 1 20.94	+5.867	−5 23 34.0	−36.95	21 18.8
17	13 3 41.80	5.872	5 38 19.8	36.86	21 17.2
18	13 6 2.80	5.877	5 53 3.3	36.76	21 15.6
19	13 8 23.93	5.883	6 7 44.5	36.66	21 14.0
20	13 10 45.20	5.889	6 22 23.1	36.55	21 12.4
21	13 13 6.61	+5.895	−6 36 59.2	−36.44	21 10.9
22	13 15 28.17	5.901	6 51 32.6	36.33	21 9.3
23	13 17 49.88	5.907	7 6 3.2	36.22	21 7.7
24	13 20 11.75	5.914	7 20 30.9	36.10	21 6.1
25	13 22 33.78	5.921	7 34 55.7	35.97	21 4.5
26	13 24 55.97	+5.928	−7 49 17.4	−35.84	21 3.0
27	13 27 18.33	5.935	8 3 35.9	35.71	21 1.4
28	13 29 40.85	5.942	8 17 51.1	35.57	20 59.9
29	13 32 3.54	5.949	8 32 3.0	35.42	20 58.3
30	13 34 26.41	5.956	8 46 11.3	35.27	20 56.8
31	13 36 49.45	+5.963	−9 0 16.1	−35.19	20 55.2
32	13 39 12.67	+5.970	−9 14 17.1	−34.96	20 53.7

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter . . .	2″.1	2″.1	2″.1	2″.2	2″.2	2″.2
Hor. Parallax . . .	3.7	3.7	3.8	3.8	3.9	3.9

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 36 49.45	+5.963	− 9 0 16.1	−35.19	20 55.2
2	13 39 12.67	5.970	9 14 17.1	34.96	20 53.7
3	13 41 36.06	5.978	9 28 14.4	34.80	20 52.1
4	13 43 59.63	5.986	9 42 7.7	34.63	20 50.6
5	13 46 23.39	5.994	9 55 57.0	34.48	20 49.0
6	13 48 47.33	+6.002	−10 9 42.1	−34 29	20 47.5
7	13 51 11.46	6.010	10 23 23.1	34.12	20 45.9
8	13 53 35.79	6.018	10 36 59.8	33.94	20 44.4
9	13 56 0.32	6.026	10 50 32.1	33.75	20 42.9
10	13 58 25.04	6.035	11 3 59.9	33.56	20 41.4
11	14 0 49.98	+6.043	−11 17 23.2	−33.37	20 39.9
12	14 3 15.13	6.052	11 30 41.9	33.18	20 38.3
13	14 5 40.49	6.061	11 43 55.9	32.98	20 36.8
14	14 8 6.07	6.070	11 57 5.1	32.78	20 35.3
15	14 10 31.88	6.080	12 10 9.4	32.57	20 33.8
16	14 12 57.92	+6.090	−12 23 8.8	−32.36	20 32.3
17	14 15 24.19	6.099	12 36 3.2	32.15	20 30.8
18	14 17 50.69	6.109	12 48 52.5	31.94	20 29.3
19	14 20 17.43	6.119	13 1 36.6	31.72	20 27.8
20	14 22 44.41	6.129	13 14 15.3	31.50	20 26.3
21	14 25 11.64	+6.139	−13 26 48.7	−31.27	20 24.8
22	14 27 39.11	6 150	13 39 16.6	31.04	20 23.3
23	14 30 6.82	6.160	13 51 39.0	30.81	20 21.9
24	14 32 34.77	6.170	14 3 55.6	30.57	20 20.4
25	14 35 2.96	6.180	14 16 6.5	30.33	20 19.0
26	14 37 31.39	+6.190	−14 28 11.4	−30.08	20 17.5
27	14 40 0.07	6.200	14 40 10.4	29.83	20 16.0
28	14 42 28.98	6.210	14 52 3.3	29.57	20 14.6
29	14 44 58.14	6.220	15 3 50.0	29.31	20 13.1
30	14 47 27.52	6.230	15 15 30.4	29.05	20 11.7
31	14 49 57.14	+6.239	−15 27 4.4	−28.78	20 10.2
32	14 52 27.00	+6.249	−15 38 31.9	−28.51	20 8.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiameter . .	2″.3	2″.3	2″.3	2″.4	2″.4	2″.5	2″.5
Hor. Parallax . .	4.0	4.1	4.1	4.2	4.3	4.4	4.5

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 9 10.98	+2.190	−17 10 55.7	+ 9.58	2 25.5
2	21 10 3.66	2.199	17 7 5.0	9.65	2 22.4
3	21 10 56.54	2.208	17 3 12.4	9.73	2 19.4
4	21 11 49.62	2.216	16 59 18.1	9.80	2 16.3
5	21 12 42.90	2.224	16 55 22.0	9.87	2 13.3
6	21 13 36.36	+2.232	−16 51 24.2	+ 9.95	2 10.2
7	21 14 30.01	2.239	16 47 24.6	10.02	2 7.2
8	21 15 23.83	2.246	16 43 23.3	10.09	2 4.1
9	21 16 17.82	2.253	16 39 20.4	10.16	2 1.1
10	21 17 11.98	2.260	16 35 15.8	10.23	1 58.1
11	21 18 6.29	+2.266	−16 31 9.6	+10.29	1 55.0
12	21 19 0.74	2.272	16 27 1.8	10.36	1 52.0
13	21 19 55.33	2.278	16 22 52.4	10.43	1 49.0
14	21 20 50.05	2.283	16 18 41.5	10.49	1 46.0
15	21 21 44.91	2.288	16 14 29.0	10.55	1 42.9
16	21 22 39.88	+2.293	−16 10 15.0	+10.61	1 39.9
17	21 23 34.97	2.298	16 5 59.6	10.67	1 36.9
18	21 24 30.17	2.302	16 1 42.7	10.73	1 33.9
19	21 25 25.46	2.306	15 57 24.4	10.79	1 30.8
20	21 26 20.86	2.310	15 53 4.7	10.85	1 27.8
21	21 27 16.34	+2.314	−15 48 43.7	+10.91	1 24.8
22	21 28 11.91	2.317	15 44 21.3	10.97	1 21.8
23	21 29 7.56	2.320	15 39 57.6	11.02	1 18.8
24	21 30 3.28	2.323	15 35 32.6	11.07	1 15.8
25	21 30 59.07	2.326	15 31 6.4	11.12	1 12.8
26	21 31 54.92	+2.329	−15 26 38.8	+11.17	1 9.8
27	21 32 50.84	2.331	15 22 10.1	11.22	1 6.8
28	21 33 46.81	2.333	15 17 40.2	11.27	1 3.8
29	21 34 42.83	2.335	15 13 9.1	11.32	1 0.8
30	21 35 38.89	2.337	15 8 36.9	11.37	0 57.8
31	21 36 35.00	+2.339	−15 4 3.6	+11.42	0 54.8
32	21 37 31.14	+2.340	−14 59 29.1	+11.46	0 51.8

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s.	s	° ′ ″	″	h m
1	21 37 31.14	+2.340	−14 59 29.1	+11.46	0 51.8
2	21 38 27.32	2.341	14 54 53.7	11.51	0 48.8
3	21 39 23.52	2.342	14 50 17.1	11.55	0 45.8
4	21 40 19.74	2.343	14 45 39.5	11.59	0 42.8
5	21 41 15.98	2.343	14 41 1.0	11.63	0 39.8
6	21 42 12.22	+2.344	−14 36 21.5	+11.67	0 36.8
7	21 43 8.47	2.344	14 31 41.1	11.70	0 33.8
8	21 44 4.72	2.343	14 26 59.8	11.74	0 30.8
9	21 45 0.96	2.343	14 22 17.7	11.78	0 27.8
10	21 45 57.19	2.342	14 17 34.8	11.81	0 24.8
11	21 46 53.39	+2.341	−14 12 51.0	+11.84	0 21.8
12	21 47 49.57	2.340	14 8 6.6	11.87	0 18.8
13	21 48 45.72	2.339	14 3 21.4	11.90	0 15.8
14	21 49 41.83	2.337	13 58 35.5	11.93	0 12.8
15	21 50 37.90	2.335	13 53 49.0	11.96	0 9.8
16	21 51 33.93	+2.333	−13 49 1.8	+11.98	0 6.8
17	21 52 29.90	2.331	13 44 14.1	12.00	0 3.8
18	21 53 25.82	2.329	13 39 25.9	12.02	0 0.8 23 57.8
19	21 54 21.67	2.326	13 34 37.1	12.04	23 54.8
20	21 55 17.46	2.323	13 29 47.9	12.06	23 51.8
21	21 56 13.18	+2.320	−13 24 58.3	+12.08	23 48.7
22	21 57 8.83	2.317	13 20 8.2	12.09	23 45.7
23	21 58 4.40	2.314	13 15 17.7	12.11	23 42.7
24	21 58 59.89	2.311	13 10 26.9	12.13	23 39.7
25	21 59 55.29	2.307	13 5 35.7	12.14	23 36.7
26	22 0 50.61	+2.303	−13 0 44.2	+12.15	23 33.7
27	22 1 45.83	2.299	12 55 52.5	12.16	23 30.7
28	22 2 40.96	2.295	12 51 0.5	12.17	23 27.6
29	22 3 35.98	2.291	12 46 8.4	12.18	23 24.6
30	22 4 30.90	2.286	12 41 16.1	12.18	23 21.6
31	22 5 25.71	+2.281	−12 36 23.6	+12.19	23 18.6
32	22 6 20.40	+2.276	−12 31 31.0	+12.19	23 15.6

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	16.″2	16.″0	15.″8	15.″7
Horizontal Parallax . .	1.5	1.5	1.5	1.5

Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	15.″7	15.″7	15.″7	15.″7
Horizontal Parallax . .	1.5	1.5	1.5	1.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 3 35.98	+2.291	−12 46 8.4	+12.18	23 24.6
2	22 4 30.90	2.286	12 41 16.1	12.18	23 21.6
3	22 5 25.71	2.281	12 36 23.6	12.19	23 18.6
4	22 6 20.40	2.276	12 31 31.0	12.19	23 15.6
5	22 7 14.97	2.271	12 26 38.4	12.19	23 12.5
6	22 8 9.42	+2.266	−12 21 45.7	+12.19	23 9.5
7	22 9 3.73	2.261	12 16 53.1	12.18	23 6.5
8	22 9 57.91	2.255	12 12 0.6	12.18	23 3.4
9	22 10 51.95	2.249	12 7 8.1	12.18	23 0.4
10	22 11 45.84	2.243	12 2 15.7	12.17	22 57.4
11	22 12 39.58	+2.236	−11 57 23.5	+12.17	22 54.3
12	22 13 33.17	2.229	11 52 31.5	12.16	22 51.3
13	22 14 26.59	2.222	11 47 39.8	12.15	22 48.2
14	22 15 19.85	2.215	11 42 48.4	12.14	22 45.2
15	22 16 12.93	2.208	11 37 57.3	12.12	22 42.1
16	22 17 5.83	+2.201	−11 33 6.6	+12.11	22 39.1
17	22 17 58.56	2.193	11 28 16.3	12.09	22 36.0
18	22 18 51.10	2.185	11 23 26.4	12.07	22 33.0
19	22 19 43.45	2.177	11 18 37.1	12.05	22 29.9
20	22 20 35.61	2.169	11 13 48.3	12.03	22 26.8
21	22 21 27.57	+2.161	−11 9 0.0	+12.00	22 23.7
22	22 22 19.32	2.153	11 4 12.4	11.98	22 20.7
23	22 23 10.87	2.144	10 59 25.4	11.95	22 17.6
24	22 24 2.22	2.135	10 54 39.0	11.92	22 14.5
25	22 24 53.35	2.126	10 49 53.4	11.89	22 11.4
26	22 25 44.26	+2.117	−10 45 8.4	+11.86	22 8.3
27	22 26 34.96	2.108	10 40 24.3	11.82	22 5.2
28	22 27 25.43	2.099	10 35 41.0	11.79	22 2.1
29	22 28 15.67	2.089	10 30 58.5	11.75	21 59.0
30	22 29 5.68	2.079	10 26 16.9	11.71	21 55.9
31	22 29 55.45	+2.069	−10 21 36.2	+11.67	21 52.8
32	22 30 44.98	+2.059	−10 16 56.5	+11.63	21 49.7

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 30 44.98	+2.059	−10 16 56.5	+11.63	21 49.7
2	22 31 34.26	2.048	10 12 17.8	11.59	21 46.6
3	22 32 23.28	2.037	10 7 40.1	11.55	21 43.5
4	22 33 12.05	2.026	10 3 3.5	11.50	21 40.4
5	22 34 0.56	2.015	9 58 28.1	11.45	21 37.3
6	22 34 48.79	+2.004	− 9 53 53.8	+11.40	21 34.1
7	22 35 36.73	1.993	9 49 20.8	11.35	21 31.0
8	22 36 24.43	1.981	9 44 49.1	11.29	21 27.8
9	22 37 11.83	1.969	9 40 18.6	11.24	21 24.7
10	22 37 58.93	1.957	9 35 49.5	11.18	21 21.5
11	22 38 45.74	+1.944	− 9 31 21.9	+11.12	21 18.4
12	22 39 32.24	1.931	9 26 55.7	11.06	21 15.2
13	22 40 18.44	1.918	9 22 31.0	11.00	21 12.0
14	22 41 4.33	1.905	9 18 7.8	10.93	21 8.8
15	22 41 49.90	1.892	9 13 46.2	10.87	21 5.6
16	22 42 35.15	+1.879	− 9 9 26.3	+10.80	21 2.4
17	22 43 20.07	1.865	9 5 8.0	10.73	20 59.2
18	22 44 4.67	1.851	9 0 51.4	10.66	20 56.0
19	22 44 48.93	1.837	8 56 36.6	10.59	20 52.8
20	22 45 32.85	1.823	8 52 23.5	10.51	20 49.6
21	22 46 16.43	+1.809	− 8 48 12.3	+10.43	20 46.4
22	22 46 59.67	1.794	8 44 2.9	10.35	20 43.2
23	22 47 42.55	1.779	8 39 55.4	10.27	20 40.0
24	22 48 25.08	1.764	8 35 49.8	10.19	20 36.7
25	22 49 7.25	1.749	8 31 46.2	10.11	20 33.5
26	22 49 49.05	+1.734	− 8 27 44.7	+10.02	20 30.2
27	22 50 30.49	1.719	8 23 45.2	9.94	20 27.0
28	22 51 11.55	1.703	8 19 47.8	9.85	20 23.7
29	22 51 52.23	1.687	8 15 52.5	9.76	20 20.5
30	22 52 32.52	1.671	8 11 59.4	9.67	20 17.2
31	22 53 12.42	+1.654	− 8 8 8.7	+ 9.57	20 14.0
32	22 53 51.92	+1.637	− 8 4 20.1	+ 9.47	20 10.7

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	15.″8	15.″9	16.″0	16.″2
Horizontal Parallax . .	1.5	1.5	1.5	1.5

Day of the Month.	7th.	15th.	23d.
Polar Semidiameter	16.″4	16.″7	17.″0
Horizontal Parallax	1.5	1.6	1.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	22 53 12.42	+1.654	−8 8 8.7	+9.57	20 14.0	1	23 10 2.81	+1.025	−6 31 35.6	+5.72	18 28.6
2	22 53 51.92	1.637	8 4 20.1	9.47	20 10.7	2	23 10 27.12	1.001	6 29 20.3	5.57	18 25.1
3	22 54 31.02	1.620	8 0 33.9	9.37	20 7.4	3	23 10 50.84	0.977	6 27 8.6	5.41	18 21.5
4	22 55 9.70	1.603	7 56 50.1	9.27	20 4.1	4	23 11 13.98	0.952	6 25 0.7	5.25	18 18.0
5	22 55 47.97	1.586	7 53 8.7	9.17	20 0.8	5	23 11 36.52	0.927	6 22 56.6	5.09	18 14.4
6	22 56 25.81	+1.568	−7 49 29.8	+9.07	19 57.5	6	23 11 58.45	+0.902	−6 20 56.4	+4.93	18 10.8
7	22 57 3.23	1.550	7 45 53.4	8.96	19 54.2	7	23 12 19.77	0.876	6 19 0.0	4.77	18 7.2
8	22 57 40.20	1.532	7 42 19.6	8.85	19 50.8	8	23 12 40.48	0.850	6 17 7.6	4.61	18 3.6
9	22 58 16.74	1.513	7 38 48.4	8.74	19 47.5	9	23 13 0.58	0.824	6 15 19.1	4.44	18 0.0
10	22 58 52.83	1.494	7 35 19.9	8.63	19 44.1	10	23 13 20.05	0.798	6 13 34.6	4.27	17 56.4
11	22 59 28.46	+1.475	−7 31 54.1	+8.52	19 40.8	11	23 13 38.88	+0.772	−6 11 54.2	+4.10	17 52.8
12	23 0 3.64	1.456	7 28 31.1	8.40	19 37.4	12	23 13 57.09	0.746	6 10 17.8	3.93	17 49.1
13	23 0 38.35	1.437	7 25 11.0	8.28	19 34.1	13	23 14 14.66	0.719	6 8 45.5	3.76	17 45.5
14	23 1 12.59	1.417	7 21 53.7	8.16	19 30.7	14	23 14 31.58	0.692	6 7 17.3	3.59	17 41.8
15	23 1 46.36	1.397	7 18 39.2	8.04	19 27.3	15	23 14 47.86	0.665	6 5 53.2	3.42	17 38.2
16	23 2 19.65	+1.377	−7 15 27.7	+7.92	19 23.9	16	23 15 3.49	+0.638	−6 4 33.3	+3.24	17 34.5
17	23 2 52.45	1.357	7 12 19.2	7.79	19 20.5	17	23 15 18.46	0.611	6 3 17.6	3.07	17 30.8
18	23 3 24.77	1.337	7 9 13.7	7.67	19 17.1	18	23 15 32.77	0.583	6 2 6.2	2.89	17 27.1
19	23 3 56.59	1.316	7 6 11.2	7.54	19 13.7	19	23 15 46.43	0.555	6 0 58.9	2.71	17 23.4
20	23 4 27.91	1.295	7 3 11.9	7.41	19 10.3	20	23 15 59.41	0.527	5 59 56.0	2.53	17 19.6
21	23 4 58.72	+1.274	− 7 0 15.7	+7.28	19 6.9	21	23 16 11.73	+0.499	−5 58 57.4	+2.35	17 15.9
22	23 5 29.03	1.252	6 57 22.6	7.15	19 3.5	22	23 16 23.37	0.471	5 58 3.1	2.17	17 12.2
23	23 5 58.82	1.230	6 54 32.8	7.01	19 0.1	23	23 16 34.33	0.443	5 57 13.1	1.99	17 8.4
24	23 6 28.09	1.208	6 51 46.2	6.87	18 56.6	24	23 16 44.61	0.414	5 56 27.4	1.81	17 4.6
25	23 6 56.84	1.186	6 49 2.9	6.73	18 53.2	25	23 16 54.19	0.385	5 55 46.3	1.62	17 0.9
26	23 7 25.05	+1.164	−6 46 22.9	+6.59	18 49.7	26	23 17 3.09	+0.356	−5 55 9.5	+1.44	16 57.1
27	23 7 52.73	1.142	6 43 46.3	6.45	18 46.2	27	23 17 11.28	0.327	5 54 37.2	1.26	16 53.2
28	23 8 19.86	1.119	6 41 13.1	6.31	18 42.7	28	23 17 18.78	0.298	5 54 9.3	1.07	16 49.4
29	23 8 46.44	1.096	6 38 43.4	6.16	18 39.2	29	23 17 25.57	0.269	5 53 45.9	0.88	16 45.6
30	23 9 12.46	1.073	6 36 17.2	6.02	18 35.7	30	23 17 31.65	0.239	5 53 27.1	0.69	16 41.8
31	23 9 37.92	+1.049	−6 33 54.6	+5.87	18 32.2	31	23 17 37.01	+0.209	−5 53 12.8	+0.50	19 37.9
32	23 10 2.81	+1.025	−6 31 35.6	+5.72	18 28.6	32	23 17 41.66	+0.179	−5 53 3.1	+0.31	16 34.1

Day of the Month.	1st.	9th.	17th.	25th.	Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	17″.3	17″.6	18″.0	18″.5	Polar Semidiameter . .	18″.9	19″.4	19″.9	20″.4
Horizontal Parallax . .	1.6	1.7	1.7	1.7	Horizontal Parallax . .	1.8	1.8	1.9	1.9

NOTE.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 17 37.01	+0.209	−5 53 12.8	+0.50	16 37.9
2	23 17 41.66	0.179	5 53 3.1	0.31	16 34.1
3	23 17 45.60	0.149	5 52 58.0	+0.12	16 30.2
4	23 17 48.81	0.119	5 52 57.4	−0.08	16 26.3
5	23 17 51.29	0.089	5 53 1.4	0.27	16 22.4
6	23 17 53.05	+0.059	−5 53 10.0	−0.46	16 18.5
7	23 17 54.09	+0.028	5 53 23.2	0.65	16 14.6
8	23 17 54.39	−0.002	5 53 41.0	0.84	16 10.6
9	23 17 53.97	0.033	5 54 3.5	1.03	16 6.7
10	23 17 52.82	0.063	5 54 30.5	1.22	16 2.7
11	23 17 50.95	−0.093	−5 55 2.0	−1.41	15 58.8
12	23 17 48.36	0.123	5 55 38.1	1.60	15 54.8
13	23 17 45.04	0.153	5 56 18.8	1.79	15 50.8
14	23 17 41.00	0.183	5 57 4.0	1.98	15 46 8
15	23 17 36.25	0.213	5 57 53.6	2.17	15 42.7
16	23 17 30.78	−0.243	−5 58 47.7	−2.35	15 38.7
17	23 17 24.59	0.273	5 59 46.3	2.54	15 34.7
18	23 17 17.70	0.302	6 0 49.2	2.72	15 30.6
19	23 17 10.09	0.331	6 1 56.6	2.90	15 26.6
20	23 17 1.79	0.361	6 3 8.3	3.08	15 22.5
21	23 16 52.78	−0.390	−6 4 24.2	−3.26	15 18.4
22	23 16 43.08	0.419	6 5 44.5	3.43	15 14.3
23	23 16 32.68	0.448	6 7 9.0	3.61	15 10 2
24	23 16 21.59	0.477	6 8 37.8	3.79	15 6.1
25	23 16 9.81	0.505	6 10 10.7	3 96	15 1.9
26	23 15 57.35	−0.533	−6 11 47.8	−4.13	14 57.8
27	23 15 44.21	0.561	6 13 28.9	4.30	14 53 6
28	23 15 30.41	0.589	6 15 14.1	4.47	14 49.5
29	23 15 15.94	0.616	6 17 3.3	4.63	14 45.3
30	23 15 0.82	0.643	6 18 56.4	4.79	14 41.1
31	23 14 45.05	−0.670	−6 20 53.3	−4.95	14 36.9
32	23 14 28.63	−0.697	−6 22 54.1	−5.11	14 32.7

Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″
Polar Semidiameter . .	21.0	21.5	22.0	22.5
Horizontal Parallax . .	2.0	2.0	2.1	2.1

AUGUST.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 14 28.63	−0.697	−6 22 54.1	−5.11	14 32.7
2	23 14 11.58	0.723	6 24 58.7	5.27	14 28.5
3	23 13 53.90	0.749	6 27 6.8	5.42	14 24.2
4	23 13 35.62	0.774	6 29 18.6	5.57	14 20.0
5	23 13 16.74	0.799	6 31 33.9	5.71	14 15.8
6	23 12 57.27	−0 823	−6 33 52.6	−5.85	14 11.5
7	23 12 37.22	0.847	6 36 14.6	5 98	14 7.2
8	23 12 16.61	0.870	6 38 39.8	6.11	14 2.9
9	23 11 55.46	0.893	6 41 8.1	6.24	13 58.7
10	23 11 33.76	0.915	6 43 39.4	6.36	13 54.4
11	23 11 11.55	−0.936	−6 46 13.7	−6.48	13 50.0
12	23 10 48.84	0.957	6 48 50.7	6.60	13 45.8
13	23 10 25.64	0.977	6 51 30.4	6.71	13 41.4
14	23 10 1.96	0.996	6 54 12.7	6.81	13 37.1
15	23 9 37.82	1.015	6 56 57.4	6.91	13 32.8
16	23 9 13.25	−1.033	−6 59 44.5	−7.00	13 28.4
17	23 8 48.25	1.050	7 2 33.8	7.09	13 24.1
18	23 8 22.83	1.067	7 5 25.2	7.18	13 19.7
19	23 7 57.02	1.083	7 8 18.6	7.26	13 15.3
20	23 7 30.81	1.098	7 11 13.9	7.34	13 11.0
21	23 7 4.30	−1.113	−7 14 10.9	−7.41	13 6.6
22	23 6 37.42	1.127	7 17 9.6	7.47	13 2.2
23	23 6 10.21	1.140	7 20 9.8	7.53	12 57.8
24	23 5 42.69	1.153	7 23 11.4	7.59	12 53.4
25	23 5 14.90	1.164	7 26 14.2	7.64	12 49.0
26	23 4 46.83	−1.175	−7 29 18.2	−7.69	12 44.6
27	23 4 18.51	1.185	7 32 23.2	7.73	12 40.2
28	23 3 49.97	1.194	7 35 29.1	7.76	12 35.8
29	23 3 21.23	1.202	7 38 35.7	7.79	12 31.4
30	23 2 52.29	1.209	7 41 42.9	7.81	12 27.0
31	23 2 23.19	−1.215	−7 44 50.5	−7.82	12 22.6
32	23 1 53.95	−1.220	−7 47 58.4	−7.83	12 18.2

Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″
Polar Semidiameter . .	22.9	23.2	23.5	23.7
Horizontal Parallax . .	2.1	2.2	2.2	2.2

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 1 53.95	−1.220	−7 47 58.4	−7.83	12 18.2
2	23 1 24.60	1.225	7 51 6.5	7 84	12 13.7
3	23 0 55.15	1.229	7 54 14.6	7.84	12 9.3
4	23 0 25.62	1.232	7 57 22.6	7.83	12 4.9
5	22 59 56.05	1.233	8 0 30.3	7.81	12 0.5
6	22 59 26.46	−1.233	−8 3 37.5	−7.79	11 56.1
7	22 58 56.86	1.232	8 6 44.1	7.76	11 51.6
8	22 58 27.29	1.232	8 9 50.0	7.73	11 47.2
9	22 57 57.76	1.229	8 12 55.0	7.69	11 42.8
10	22 57 28.30	1.225	8 15 59.0	7.64	11 38.4
11	22 56 58.94	−1.221	−8 19 1.8	−7.59	11 33.9
12	22 56 29.68	1.216	8 22 3.3	7.53	11 29.5
13	22 56 0.56	1.210	8 25 3.4	7.47	11 25.1
14	22 55 31.60	1.203	8 28 2.0	7.40	11 20.7
15	22 55 2.82	1.195	8 30 58.8	7.33	11 16.3
16	22 54 34.23	−1.186	−8 33 53.8	−7.25	11 11.9
17	22 54 5.86	1.177	8 36 46.9	7.17	11 7.5
18	22 53 37.73	1.167	8 39 38.0	7.08	11 3.1
19	22 53 9.86	1.156	8 42 26.9	6.99	10 58.7
20	22 52 42.27	1.143	8 45 13.5	6.89	10 54.3
21	22 52 14.98	−1.130	−8 47 57.7	−6 79	10 50.0
22	22 51 48.01	1.116	8 50 39.4	6.68	10 45.6
23	22 51 21.38	1.102	8 53 18.5	6.57	10 41.2
24	22 50 55.10	1.087	8 55 54.9	6.45	10 36.8
25	22 50 29.20	1.071	8 58 28.4	6.33	10 32.5
26	22 50 3.70	−1.054	−9 0 59.1	−6.21	10 28.1
27	22 49 38.61	1.036	9 3 26.7	6.08	10 23.8
28	22 49 13.96	1.017	9 5 51.1	5.95	10 19.4
29	22 48 49.76	0.998	9 8 12.3	5.81	10 15.1
30	22 48 26.04	0.978	9 10 30.2	5.67	10 10.8
31	22 48 2.81	−0.957	−9 12 44.6	−5.53	10 6.5
32	22 47 40.08	−0.936	−9 14 55.4	−5.38	10 2.2

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	23″.7	23″.6	23″.4	23″.2
Horizontal Parallax . .	2.2	2.2	2.2	2.2

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	22 48 2.81	−0.957	−9 12 44.6	−5.53	10 6.5
2	22 47 40.08	0.936	9 14 55.4	5.38	10 2.2
3	22 47 17.88	0.914	9 17 2.6	5.23	9 57.9
4	22 46 56.23	0.891	9 19 6.2	5.07	9 53.6
5	22 46 35.13	0.867	9 21 5.9	4.91	9 49.3
6	22 46 14.61	−0.843	−9 23 1.8	−4.75	9 45.1
7	22 45 54.67	0.818	9 24 53.7	4.58	9 40.8
8	22 45 35.33	0.793	9 26 41.6	4.41	9 36.5
9	22 45 16.62	0.767	9 28 25.4	4 24	9 32.3
10	22 44 58.53	0.741	9 30 5.1	4.07	9 28.1
11	22 44 41.08	−0.714	−9 31 40.6	−3.89	9 23.9
12	22 44 24.27	0.687	9 33 11.8	3.71	9 19.7
13	22 44 8.13	0.659	9 34 38.7	3 53	9 15.5
14	22 43 52.66	0.631	9 36 1.3	3.35	9 11.3
15	22 43 37.86	0.602	9 37 19.6	3.17	9 7.1
16	22 43 23.75	−0 573	−9 38 33.4	−2.99	9 3.0
17	22 43 10.33	0.544	9 39 42 9	2.80	8 58.8
18	22 42 57.61	0.515	9 40 47.8	2.62	8 54.7
19	22 42 45.60	0.485	9 41 48.3	2.43	8 50.6
20	22 42 34.31	0.455	9 42 44.3	2.24	8 46.4
21	22 42 23.74	−0.425	−9 43 35.7	−2.05	8 42.3
22	22 42 13.89	0.395	9 44 22.5	1.86	8 38.3
23	22 42 4.78	0.364	9 45 4.8	1.66	8 34.2
24	22 41 56.41	0 333	9 45 42.4	1.47	8 20.1
25	22 41 48.78	0 302	9 46 15.4	1.28	8 26.1
26	22 41 41.91	−0.271	−9 46 43 8	−1.08	8 22.0
27	22 41 35.79	0.239	9 47 7.5	0.89	8 18.0
28	22 41 30.42	0.207	9 47 26.6	0.70	8 14.0
29	22 41 25.83	0.175	9 47 40.9	0.50	8 10.0
30	22 41 22.01	0.143	9 47 50.5	0.31	8 6.0
31	22 41 18.95	−0.111	−9 47 55.4	−0.11	8 2.0
32	22 41 16.66	−0.079	−9 47 55.6	+0.09	7 58.0

Day of the Month.	8th.	16th.	24th.
Polar Semidiameter	22″.8	22″.4	21″.9
Horizontal Parallax	2.1	2.1	2.1

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	22 41 16.66	−0.079	−9 47 55.6	+0.06	7 58.0	1	22 45 59.99	+0.843	−9 12 35.4	+ 5.65	6 4.9
2	22 41 15.15	0.047	9 47 51.1	0.26	7 54.1	2	22 46 20.56	0.871	9 10 17.7	5.82	6 1.3
3	22 41 14.42	−0.014	9 47 41.8	0.46	7 50.1	3	22 46 41.79	0.899	9 7 56.0	5.99	5 57.7
4	22 41 14.46	+0.018	9 47 27.9	0.66	7 46.2	4	22 47 3.68	0.926	9 5 30.3	6.15	5 54.1
5	22 41 15.28	0.051	9 47 9.2	0.86	7 42.3	5	22 47 26.22	0.953	9 3 0.6	6.32	5 50.6
6	22 41 16.88	+0.083	−9 46 45.8	+1.06	7 38.4	6	22 47 49.40	+0.979	−9 0 27.0	+ 6.48	5 47.0
7	22 41 19.25	0.115	9 46 17.7	1.27	7 34.5	7	22 48 13.22	1.005	8 57 49.6	6.64	5 43.5
8	22 41 22.39	0.147	9 45 44.9	1.47	7 30.6	8	22 48 37.66	1.031	8 55 8.3	6.80	5 40.0
9	22 41 26.30	0.179	9 45 7.5	1.66	7 26.7	9	22 49 2.72	1.057	8 52 23.2	6.96	5 36.5
10	22 41 30.98	0.211	9 44 25.4	1.85	7 22.9	10	22 49 28.40	1.082	8 49 34.4	7.11	5 33.0
11	22 41 36.43	+0.243	−9 43 38.8	+2.04	7 19.1	11	22 49 54.67	+1.107	−8 46 41.9	+ 7.26	5 29.5
12	22 41 42.64	0.275	9 42 47.5	2.23	7 15.3	12	22 50 21.54	1.132	8 43 45.8	7.41	5 26.0
13	22 41 49.60	0.306	9 41 51.7	2.42	7 11.4	13	22 50 49.00	1.156	8 40 46.0	7.56	5 22.5
14	22 41 57.32	0.338	9 40 51.3	2.61	7 7.6	14	22 51 17.04	1.180	8 37 42.7	7.71	5 19.0
15	22 42 5.79	0.369	9 39 46.4	2.80	7 3.9	15	22 51 45.65	1.204	8 34 35.8	7.86	5 15.6
16	22 42 15.01	+0.400	−9 38 37.0	+2.98	7 0.1	16	22 52 14.83	+1.227	−8 31 25.4	+ 8.00	5 12.1
17	22 42 24.97	0.431	9 37 23.2	3.17	6 56.3	17	22 52 44.55	1.250	8 28 11.6	8.15	5 8.7
18	22 42 35.66	0.462	9 36 4.9	3.36	6 52.6	18	22 53 14.84	1.273	8 24 54.3	8.29	5 5.3
19	22 42 47.09	0.492	9 34 42.2	3.54	6 48.8	19	22 53 45.66	1.296	8 21 33.7	8.43	5 1.9
20	22 42 59.25	0.522	9 33 15.2	3.72	6 45.1	20	22 54 17.02	1.318	8 18 9.8	8.57	4 58.5
21	22 43 12.14	+0.552	−9 31 43.8	+3.90	6 41.4	21	22 54 48.91	+1.340	−8 14 42.5	+ 8.71	4 55.1
22	22 43 25.75	0.582	9 30 8.0	4.08	6 37.7	22	22 55 21.33	1.362	8 11 11.9	8.84	4 51.7
23	22 43 40.08	0.612	9 28 28.0	4.26	6 34.0	23	22 55 54.26	1.384	8 7 38.1	8.98	4 48.3
24	22 43 55.12	0.642	9 26 43.7	4.44	6 30.3	24	22 56 27.71	1.405	8 4 1.1	9.11	4 44.9
25	22 44 10.87	0.671	9 24 55.1	4.62	6 26.6	25	22 57 1.66	1.426	8 0 20.9	9.24	4 41.5
26	22 44 27.32	+0.700	−9 23 2.2	+4.80	6 23.0	26	22 57 36.11	+1.446	−7 56 37.5	+ 9.37	4 38.1
27	22 44 44.48	0.729	9 21 5.1	4.97	6 19.3	27	22 58 11.05	1.466	7 52 51.1	9.50	4 34.8
28	22 45 2.33	0.758	9 19 3.9	5.14	6 15.7	28	22 58 46.47	1.486	7 49 1.6	9.62	4 31.4
29	22 45 20.86	0.787	9 16 58.5	5.31	6 12.1	29	22 59 22.37	1.506	7 45 9.1	9.75	4 28.1
30	22 45 40 09	0.815	9 14 49.0	5.48	6 8.5	30	22 59 58.73	1.525	7 41 13.6	9.88	4 24.8
31	22 45 59.99	+0.843	−9 12 35.4	+5.65	6 4.9	31	23 0 35.56	+1.544	−7 37 15.1	+10.00	4 21.5
32	22 46 20.56	+0.871	−9 10 17.7	+5.82	6 1.3	32	23 1 12.84	+1.563	−7 33 13.7	+10.12	4 18.2

Day of the Month.	1st.	9th.	17th.	25th.
Polar Semidiameter . .	21″.4	20″.8	20″.3	19″.8
Horizontal Parallax . .	2.0	2.0	1.9	1.9

Day of the Month.	3d.	11th.	19th.	27th.	35th.
Polar Semidiameter . .	19″.3	18″.8	18″.3	17″.9	17″.5
Horizontal Parallax . .	1.8	1.8	1.7	1.7	1.6

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	JANUARY.						FEBRUARY.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	11 15 52.40	−0.065	+6 53 10.8	+1.14	16 29.7	1	11 11 59.24	−0.536	+7 25 52.7	+3.92	14 23.9
2	11 15 50.64	0.082	6 53 39.4	1.24	16 25.8	2	11 11 46.25	0.548	7 27 27.6	3.99	14 19.7
3	11 15 48.48	0.099	6 54 10.5	1.35	16 21.8	3	11 11 32.97	0.559	7 29 4.1	4.05	14 15.6
4	11 15 45.91	0.116	6 54 44.1	1.46	16 17.8	4	11 11 19.41	0.570	7 30 42.0	4.11	14 11.4
5	11 15 42.93	0.133	6 55 20.3	1.56	16 13.8	5	11 11 5.57	0.581	7 32 21.4	4.17	14 7.3
6	11 15 39.53	−0.150	+6 55 58.9	+1.66	16 9.8	6	11 10 51.48	−0.592	+7 34 2.1	+4.23	14 3.1
7	11 15 35.74	0.166	6 56 40.0	1.76	16 5.8	7	11 10 37.13	0.603	7 35 44.2	4.28	13 58.9
8	11 15 31.54	0.183	6 57 23.5	1.86	16 1.8	8	11 10 22.54	0.613	7 37 27.5	4.33	13 54.7
9	11 15 26.95	0.200	6 58 9.5	1.96	15 57.8	9	11 10 7.71	0.623	7 39 12.0	4.38	13 50.6
10	11 15 21.96	0.217	6 58 57.9	2.06	15 53.8	10	11 9 52.65	0.632	7 40 57.7	4.43	13 46.4
11	11 15 16.57	−0.233	+6 59 48.8	+2.16	15 49.8	11	11 9 37.37	−0.641	+7 42 44.5	+4.47	13 42.2
12	11 15 10.80	0.249	7 0 42.0	2.26	15 45.8	12	11 9 21.88	0.650	7 44 32.2	4.51	13 38.0
13	11 15 4.63	0.265	7 1 37.5	2.36	15 41.7	13	11 9 6.19	0.658	7 46 21.0	4.55	13 33.8
14	11 14 58.07	0.281	7 2 35.4	2.46	15 37.7	14	11 8 50.31	0.666	7 48 10.6	4.59	13 29.6
15	11 14 51.13	0.297	7 3 35.5	2.56	15 33.6	15	11 8 34.24	0.673	7 50 1.2	4.62	13 25.4
16	11 14 43.82	−0.313	+7 4 37.0	+2.65	15 29.6	16	11 8 18.00	−0.680	+7 51 52.4	+4.65	13 21.2
17	11 14 36.14	0.328	7 5 42.5	2.74	15 25.5	17	11 8 1.59	0.687	7 53 44.3	4.68	13 17.0
18	11 14 28.08	0.343	7 6 49.3	2.83	15 21.4	18	11 7 45.03	0.693	7 55 36.9	4.70	13 12.8
19	11 14 19.66	0.358	7 7 58.3	2.92	15 17.4	19	11 7 28.32	0.699	7 57 30.0	4.72	13 8.6
20	11 14 10.88	0.373	7 9 9.3	3.01	15 13.3	20	11 7 11.47	0.705	7 59 23.7	4.74	13 4.4
21	11 14 1.75	−0.388	+7 10 22.5	+3.09	15 9.2	21	11 6 54.49	−0.710	+8 1 17.8	+4.76	13 0.2
22	11 13 52.26	0.402	7 11 37.7	3.17	15 5.1	22	11 6 37.40	0.715	8 3 12.3	4.77	12 56.0
23	11 13 42.43	0.416	7 12 54.8	3.25	15 1.0	23	11 6 20.20	0.719	8 5 7.1	4.78	12 51.7
24	11 13 32.26	0.430	7 14 13.9	3.33	14 56.9	24	11 6 2.89	0.723	8 7 2.2	4.79	12 47.5
25	11 13 21.76	0.444	7 15 35.0	3.41	14 52.8	25	11 5 45.49	0.727	8 8 57.5	4.80	12 43.3
26	11 13 10.92	−0.458	+7 16 57.9	+3.49	14 48.7	26	11 5 28.01	−0.730	+8 10 53.0	+4.81	12 39.1
27	11 12 59.75	0.472	7 18 22.7	3.57	14 44.6	27	11 5 10.46	0.733	8 12 48.5	4.81	12 34.8
28	11 12 48.27	0.485	7 19 49.3	3.64	14 40.4	28	11 4 52.84	0.735	8 14 44.1	4.81	12 30.6
29	11 12 36.47	0.498	7 21 17.6	3.71	14 36.3	29	11 4 35.17	0.737	8 16 39.7	4.81	12 26.4
30	11 12 24.36	0.511	7 22 47.6	3.78	14 32.2	30	11 4 17.46	0.739	8 18 35.1	4.81	12 22.2
31	11 12 11.95	−0.524	+7 24 19.4	+3.85	14 28.0	31	11 3 59.71	−0.740	+8 20 30.4	+4.80	12 18.0
32	11 11 59.24	−0.536	+7 25 52.7	+3.92	14 23.9	32	11 3 41.94	−0.741	+8 22 25.5	+4.79	12 13.7

Day of the Month.	1st.	9th.	7th.	25th.	Day of the Month.	2d.	10th.	18th.	26th.
Polar Semidiameter . .	8.″8	8.″9	9.″0	9.″1	Polar Semidiameter . .	9.″2	9.″3	9.″3	9.″3
Horizontal Parallax . .	1.0	1.0	1.0	1.0	Horizontal Parallax . .	1.0	1.0	1.1	1.1

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 4 35.17	−0.737	+8 16 39.7	+4.81	12 26.4
2	11 4 17.46	0.739	8 18 35.1	4.81	12 22.2
3	11 3 50.71	0.740	8 20 30.4	4.80	12 18.0
4	11 3 41.94	0.741	8 22 25.5	4.79	12 13.7
5	11 3 24.15	0.741	8 24 20.3	4.78	12 9.5
6	11 3 6.36	−0.741	+8 26 14.8	+4.76	12 5.3
7	11 2 48.58	0.741	8 28 8.8	4.74	12 1.0
8	11 2 30.81	0.740	8 30 2.4	4.72	11 56.8
9	11 2 13.07	0.739	8 31 55.4	4.70	11 52.6
10	11 1 55.36	0.737	8 33 47.9	4.67	11 48.3
11	11 1 37.71	−0.735	+8 35 39.7	+4.64	11 44.1
12	11 1 20.12	0.732	8 37 30.7	4.61	11 39.9
13	11 1 2.59	0.729	8 39 20.9	4.58	11 35.7
14	11 0 45.14	0.725	8 41 10.3	4.54	11 31.5
15	11 0 27.78	0.721	8 42 58.8	4.50	11 27.2
16	11 0 10.52	−0.717	+8 44 46.2	+4.46	11 23.0
17	10 59 53.37	0.712	8 46 32.7	4.42	11 18.8
18	10 59 36.34	0.707	8 48 18.1	4.37	11 14.6
19	10 59 19.44	0.701	8 50 2.3	4.32	11 10.4
20	10 59 2.67	0.695	8 51 45.3	4.27	11 6.2
21	10 58 46.04	−0.689	+8 53 27.1	+4.22	11 2.0
22	10 58 29.57	0.683	8 55 7.6	4.16	10 57.8
23	10 58 13.26	0.676	8 56 46.8	4.10	10 53.6
24	10 57 57.12	0.669	8 58 24.6	4.04	10 49.4
25	10 57 41.15	0.661	9 0 0.9	3.98	10 45.2
26	10 57 25.38	−0.653	+9 1 35.8	+3.92	10 41.0
27	10 57 9.79	0.645	9 3 9.0	3.86	10 36.8
28	10 56 54.41	0.637	9 4 40.8	3.79	10 32.6
29	10 56 39.24	0.628	9 6 11.0	3.72	10 28.4
30	10 56 24.28	0.619	9 7 39.6	3.65	10 24.2
31	10 56 9.55	−0.609	+9 9 6.4	+3.58	10 20.1
32	10 55 55.05	−0.599	+9 10 31.5	+3.51	10 15.9

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	9.″3	9.″3	9.″3	9.″2
Horizontal Parallax . .	1.1	1.1	1.1	1.0

APRIL.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	10 55 55.05	−0.599	+9 10 31.5	+3.51	10 15.9
2	10 55 40.79	0.589	9 11 54.9	3.44	10 11.7
3	10 55 26.78	0.578	9 13 16.5	3.36	10 7.6
4	10 55 13.03	0.567	9 14 36.2	3.28	10 3.4
5	10 54 59.53	0.556	9 15 54.0	3.20	9 59.3
6	10 54 46.31	−0.545	+9 17 9.9	+3.12	9 55.1
7	10 54 33.36	0.533	9 18 23.8	3.04	9 51.0
8	10 54 20.70	0.521	9 19 35.7	2.96	9 46.8
9	10 54 8.34	0.509	9 20 45.6	2.88	9 42.7
10	10 53 56.26	0.497	9 21 53.5	2.79	9 38.6
11	10 53 44.49	−0.484	+9 22 59.2	+2.70	9 34.4
12	10 53 33.04	0.471	9 24 2.8	2.61	9 30.3
13	10 53 21.69	0.458	9 25 4.3	2.52	9 26.2
14	10 53 11.07	0.445	9 26 3.6	2.43	9 22.1
15	10 53 0.56	0.431	9 27 0.7	2.34	9 18.0
16	10 52 50.40	−0.417	+9 27 55.5	+2.24	9 13.9
17	10 52 40.56	0.403	9 28 48.1	2.14	9 9.8
18	10 52 31.06	0.389	9 29 38.5	2.05	9 5.7
19	10 52 21.91	0.375	9 30 26.5	1.96	9 1.6
20	10 52 13.10	0.360	9 31 12.3	1.86	8 57.6
21	10 52 4.64	−0.345	+9 31 55.8	+1.77	8 53.5
22	10 51 56.54	0.330	9 32 36.9	1.67	8 49.4
23	10 51 48.78	0.315	9 33 15.7	1.58	8 45.4
24	10 51 41.39	0.300	9 33 52.2	1.48	8 41.3
25	10 51 34.35	0.285	9 34 26.4	1.38	8 37.3
26	10 51 27.68	−0.270	+9 34 58.0	+1.28	8 33.2
27	10 51 21.38	0.255	9 35 27.4	1.18	8 29.2
28	10 51 15.45	0.240	9 35 54.4	1.08	8 25.2
29	10 51 9.89	0.225	9 36 19.1	0.99	8 21.2
30	10 51 4.70	0.209	9 36 41.3	0.89	8 17.1
31	10 50 59.89	−0.193	+9 37 1.1	+0.79	8 13.1
32	10 50 55.46	−0.177	+0 37 18.5	+0.69	8 9.1

Day of the Month.	7th.	15th.	23d.
Polar Semidiameter	9.″2	9.″1	9.″0
Horizontal Parallax	1.0	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The — sign indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s.	s	° ′ ″	″	h m
1	10 50 59.89	−0.193	+9 37 1.1	+0.79	8 13.1	1	10 51 43.26	+0.306	+9 27 17.6	−2.30	6 12.0
2	10 50 55.46	0.177	9 37 18.5	0.69	8 9.1	2	10 51 50.79	0.322	9 26 21.4	2.39	6 8.2
3	10 50 51.41	0.161	9 37 33.5	0.59	8 5.1	3	10 51 58.68	0.337	9 25 22.9	2.48	6 4.4
4	10 50 47.75	0.145	9 37 46.0	0.49	8 1.1	4	10 52 6.94	0.352	9 24 22.3	2.57	6 0.6
5	10 50 44.49	0.129	9 37 56.1	0.38	7 57.1	5	10 52 15.56	0.367	9 23 19.3	2.66	5 56.8
6	10 50 41.60	−0.113	+9 38 3.8	+0.28	7 53.2	6	10 52 24.55	+0.382	+9 22 14.3	−2.75	5 53.1
7	10 50 39.10	0.096	9 38 9.0	0.17	7 49.2	7	10 52 33.91	0.397	9 21 7.1	2.84	5 49.3
8	10 50 36.99	0.080	9 38 11.8	+0.07	7 45.2	8	10 52 43.61	0.412	9 19 57.7	2.93	5 45.5
9	10 50 35.27	0.063	9 38 12.1	−0.04	7 41.3	9	10 52 53.67	0.427	9 18 46.3	3.02	5 41.7
10	10 50 33.95	0 047	9 38 10.0	0.14	7 37.3	10	10 53 4.09	0.442	9 17 32.6	3.11	5 38.0
11	10 50 33.02	−0.030	+9 38 5.4	−0.24	7 33.4	11	10 53 14.86	+0.456	+9 16 16.9	−3.20	5 34.2
12	10 50 32.49	−0.014	9 37 58.4	0.34	7 29.5	12	10 53 25.97	0.470	9 14 59.1	3.29	5 30.5
13	10 50 32.34	+0.003	9 37 49.0	0.45	7 25.5	13	10 53 37.42	0.484	9 13 39.3	3.38	5 26.7
14	10 50 32.59	0.020	9 37 37.1	0.55	7 21.6	14	10 53 49.22	0.498	9 12 17.4	3.46	5 23.0
15	10 50 33.24	0.036	9 37 22.7	0.65	7 17.7	15	10 54 1.36	0.512	9 10 53.5	3.54	5 19.2
16	10 50 34.27	+0.052	+9 37 5.9	−0.75	7 13.8	16	10 54 13.82	+0.526	+9 9 27.7	−3.62	5 15.5
17	10 50 35.69	0.068	9 36 46.7	0.85	7 9.8	17	10 54 26.61	0.540	9 7 59.8	3.70	5 11.8
18	10 50 37.52	0.084	9 36 25.2	0.95	7 5.9	18	10 54 39.74	0.554	9 6 30.0	3.78	5 8.1
19	10 50 39.73	0.100	9 36 1.2	1.05	7 2.1	19	10 54 53.18	0.567	9 4 58.3	3.86	5 4.4
20	10 50 42.32	0.116	9 35 34.9	1.15	6 58.2	20	10 55 6.94	0.580	9 3 24.7	3.94	5 0.7
21	10 50 45.30	+0.132	+9 35 6.2	−1.25	6 54.3	21	10 55 21.02	+0.593	+9 1 49.2	−4.02	4 57.0
22	10 50 48.67	0.148	9 34 35.1	1.34	6 50.4	22	10 55 35.41	0 606	9 0 11.8	4.10	4 53.3
23	10 50 52.42	0.164	9 34 1.8	1.44	6 46.5	23	10 55 50.12	0.619	8 58 32.6	4.18	4 49.6
24	10 50 56.55	0.180	9 33 26.1	1.54	6 42.7	24	10 56 5.13	0.632	8 56 51.6	4.26	4 45.9
25	10 51 1.07	0.196	9 32 48.0	1.63	6 38.8	25	10 56 20.45	0.645	8 55 8.6	4.33	4 42.2
26	10 51 5.96	+0.212	+9 32 7.6	−1.73	6 35.0	26	10 56 36.06	+0.657	+8 53 23.9	−4.40	4 38.6
27	10 51 11.24	0.228	9 31 25.0	1.82	6 31.2	27	10 56 51.98	0.669	8 51 37.5	4.48	4 34.9
28	10 51 16.89	0.244	9 30 40.1	1.92	6 27.3	28	10 57 8.19	0.681	8 49 49.3	4.55	4 31.3
29	10 51 22.92	0.260	9 29 52.8	2.02	6 23.5	29	10 57 24.69	0.693	8 47 59.4	4.62	4 27.6
30	10 51 29.33	0.276	9 29 3.3	2.11	6 19.7	30	10 57 41.48	0.705	8 46 7.7	4.69	4 24.0
31	10 51 36.11	+0.291	+9 28 11.6	−2.21	6 15.8	31	10 57 58.57	+0.717	+8 44 14.3	−4.76	4 20.3
32	10 51 43.26	+0.306	+9 27 17.6	−2.30	6 12.0	32	10 58 15.92	+0.729	+8 42 19.3	−4.83	4 16.7

Day of the Month.	1st.	9th.	17th.	25th.	Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″		″	″	″	″
Polar Semidiameter . .	8.9	8.7	8.6	8.5	Polar Semidiameter . .	8.4	8.2	8.1	8.0
Horizontal Parallax . .	1.0	1.0	1.0	1.0	Horizontal Parallax . .	0.9	0.9	0.9	0.9

Note.—The sign + indicates north declinations: the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	10 57 58.57	+0.717	+8 44 14.3	−4.76	4 20.3
2	10 58 15.92	0.729	8 42 19.3	4.83	4 16.7
3	10 58 33.56	0.741	8 40 22.6	4.90	4 13.0
4	10 58 51.48	0.752	8 38 24.3	4.97	4 9.4
5	10 59 9.67	0.763	8 36 24.3	5.04	4 5.7
6	10 59 28.12	+0.774	+8 34 22.8	−5.10	4 2.1
7	10 59 46.84	0.785	8 32 19.7	5.17	3 58.5
8	11 0 5.83	0.796	8 30 14.9	5.24	3 54.9
9	11 0 25.08	0.807	8 28 8.7	5.30	3 51.3
10	11 0 44.57	0.818	8 26 1.0	5.36	3 47.7
11	11 1 4.31	+0.828	+8 23 51.8	−5.42	3 44.1
12	11 1 24.30	0.838	8 21 41.0	5.48	3 40.5
13	11 1 44.53	0.848	8 19 28.9	5.54	3 36.9
14	11 2 4.99	0.858	8 17 15.3	5.60	3 33.3
15	11 2 25.69	0.868	8 15 0.4	5.66	3 29.7
16	11 2 46.62	+0.877	+8 12 44.1	−5.71	3 26.1
17	11 3 7.78	0.886	8 10 26.5	5.77	3 22.5
18	11 3 29.15	0.895	8 8 7.6	5.82	3 18.9
19	11 3 50.74	0.904	8 5 47.4	5.87	3 15.3
20	11 4 12.54	0.913	8 3 25.9	5.92	3 11.8
21	11 4 34.56	+0.921	+8 1 3.2	−5.97	3 8.2
22	11 4 56.77	0.930	7 58 39.3	6.02	3 4.7
23	11 5 19.19	0.939	7 56 14.1	6.07	3 1.1
24	11 5 41.81	0.947	7 53 47.8	6.12	2 57.6
25	11 6 4.64	0.955	7 51 20.4	6.17	2 54.0
26	11 6 27.65	+0.963	+7 48 51.8	−6.22	2 50.5
27	11 6 50.85	0.971	7 46 21.9	6.27	2 46.9
28	11 7 14.23	0.979	7 43 51.1	6.32	2 43.4
29	11 7 37.80	0.987	7 41 19.2	6.36	2 39.8
30	11 8 1.54	0.995	7 38 46.2	6.40	2 36.3
31	11 8 25.46	+1.002	+7 36 12.2	−6.44	2 32.7
32	11 8 49.56	+1.009	+7 33 37.2	−6.48	2 29.2

Day of the Month.	4th.	12th.	20th.	28th.
Polar Semidiameter . .	7.″9	7.″8	7.″8	7.″7
Horizontal Parallax . .	0.9	0.9	0.9	0.9

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 8 49.56	+1.009	+7 33 37.2	−6.48	2 29.2
2	11 9 13.83	1.016	7 31 1.2	6.52	2 25.6
3	11 9 38.26	1.022	7 28 24.3	6.56	2 22.1
4	11 10 2.84	1.028	7 25 46.4	6.60	2 18.6
5	11 10 27.58	1.034	7 23 7.5	6.64	2 15.1
6	11 10 52.48	+1.040	+7 20 27.8	−6.68	2 11.6
7	11 11 17.52	1.046	7 17 47.2	6.72	2 8.1
8	11 11 42.70	1.052	7 15 5.8	6.75	2 4.6
9	11 12 8.03	1.058	7 12 23.4	6.78	2 1.1
10	11 12 33.50	1.063	7 9 40.4	6.81	1 57.6
11	11 12 59.08	+1.068	+7 6 56.7	−6.84	1 54.1
12	11 13 24.80	1.073	7 4 12.2	6.87	1 50.6
13	11 13 50.63	1.078	7 1 27.0	6.90	1 47.1
14	11 14 16.58	1.083	6 58 41.1	6.93	1 43.6
15	11 14 42.65	1.088	6 55 54.5	6.96	1 40.1
16	11 15 8.83	+1.093	+6 53 7.4	−6.98	1 36.6
17	11 15 35.13	1.098	6 50 19.6	7.01	1 33.1
18	11 16 1.52	1.102	6 47 31.2	7.03	1 29.6
19	11 16 28.01	1.106	6 44 42.3	7.05	1 26.1
20	11 16 54.60	1.110	6 41 52.9	7.07	1 22.6
21	11 17 21.28	+1.114	+6 39 2.9	−7.09	1 19.1
22	11 17 48.05	1.118	6 36 12.4	7.11	1 15.6
23	11 18 14.91	1.121	6 33 21.5	7.13	1 12.1
24	11 18 41.85	1.124	6 30 30.1	7.15	1 8.6
25	11 19 8.87	1.127	6 27 38.3	7.17	1 5.1
26	11 19 35.96	+1.130	+6 24 46.1	−7.19	1 1.6
27	11 20 3.13	1.133	6 21 53.6	7.21	0 58.2
28	11 20 30.36	1.136	6 19 0.6	7.22	0 54.7
29	11 20 57.66	1.139	6 16 7.4	7.23	0 51.2
30	11 21 25.02	1.141	6 13 13.8	7.24	0 47.7
31	11 21 52.44	+1.143	+6 10 19.9	−7.25	0 44.2
32	11 22 19.91	+1.145	+6 7 25.8	−7.26	0 40.8

Day of the Month.	5th.	13th.	21st.	29th.
Polar Semidiameter . .	7.″6	7.″6	7.″5	7.″5
Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 22 19.91	+1.145	+6 7 25.8	−7.26	0 40.8
2	11 22 47.44	1.147	6 4 31.5	7.27	0 37.3
3	11 23 15.01	1.149	6 1 36.9	7.27	0 33.8
4	11 23 42.61	1.151	5 58 42.2	7.28	0 30.3
5	11 24 10.24	1.152	5 55 47.3	7.28	0 26.9
6	11 24 37.91	+1.153	+5 52 52.4	−7.29	0 23.4
7	11 25 5.61	1.154	5 49 57.3	7.29	0 19.9
8	11 25 33.33	1.155	5 47 2.2	7.30	0 16.4
9	11 26 1.07	1.156	5 44 7.0	7.30	0 13.0
10	11 26 28.83	1.156	5 41 11.9	7.30	0 9.5
11	11 26 56.60	+1.157	+5 38 16.8	−7.29	0 6.0
12	11 27 24.37	1.157	5 35 21.7	7.29	0 2.5 23 59.1
13	11 27 52.14	1.157	5 32 26.8	7.28	23 55.6
14	11 28 19.91	1.157	5 29 31.9	7.28	23 52.1
15	11 28 47.69	1.156	5 26 37.1	7.27	23 48.6
16	11 29 15.45	+1.156	+5 23 42.5	−7.27	23 45.2
17	11 29 43.20	1.155	5 20 48.1	7.26	23 41.7
18	11 30 10.94	1.155	5 17 53.9	7.25	23 38.2
19	11 30 38.65	1.154	5 14 59.9	7.25	23 34.8
20	11 31 6.34	1.153	5 12 6.2	7.24	23 31.3
21	11 31 34.01	+1.152	+5 9 12.8	−7.23	23 27.8
22	11 32 1.65	1.151	5 6 19.6	7.22	23 24.3
23	11 32 29.26	1.150	5 3 26.7	7.20	23 20.8
24	11 32 56.83	1.148	5 0 34.3	7.18	23 17.4
25	11 33 24.35	1.146	4 57 42.1	7.17	23 13.9
26	11 33 51.84	+1.144	+4 54 50.4	−7.15	23 10.5
27	11 34 19.28	1.142	4 51 59.1	7.13	23 7.0
28	11 34 46.66	1.140	4 49 8.3	7.11	23 3.5
29	11 35 13.98	1.137	4 46 18.0	7.09	23 0.0
30	11 35 41.24	1.134	4 43 28.2	7.07	22 56.6
31	11 36 8.44	+1.131	+4 40 38.9	−7.05	22 53.1
32	11 36 35.57	+1.128	+4 37 50.2	−7.02	22 49.6

OCTOBER

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	11 36 8.44	+1.131	+4 40 38.9	−7.05	22 53.1
2	11 36 35.57	1.128	4 37 50.2	7.02	22 49.6
3	11 37 2.62	1.125	4 35 2.1	6.99	22 46.1
4	11 37 29.59	1.122	4 32 14.7	6.96	22 42.7
5	11 37 56.48	1.118	4 29 27.9	6.93	22 39.2
6	11 38 23.27	+1.114	+4 26 41.8	−6.90	22 35.7
7	11 38 49.98	1.110	4 23 56.5	6.87	22 32.2
8	11 39 16.59	1.106	4 21 11.8	6.84	22 28.7
9	11 39 43.10	1.102	4 18 28.0	6.81	22 25.2
10	11 40 9.50	1.098	4 15 45.1	6.78	22 21.7
11	11 40 35.79	+1.093	+4 13 2.9	−6.74	22 18.2
12	11 41 1.97	1.088	4 10 21.5	6.70	22 14.7
13	11 41 28.05	1.083	4 7 41.1	6.66	22 11.2
14	11 41 53.99	1.078	4 5 1.7	6.62	22 7.7
15	11 42 19.80	1.073	4 2 23.2	6.58	22 4.2
16	11 42 45.49	+1.068	+3 59 45.6	−6.54	22 0.7
17	11 43 11.05	1.062	3 57 9.1	6.50	21 57.2
18	11 43 36.47	1.056	3 54 33.6	6.46	21 53.7
19	11 44 1.75	1.050	3 51 59.1	6.41	21 50.1
20	11 44 26.89	1.044	3 49 25.7	6.37	21 46.6
21	11 44 51.88	+1.038	+3 46 53.4	−6.33	21 43.1
22	11 45 16.72	1.032	3 44 22.2	6.28	21 39.6
23	11 45 41.40	1.025	3 41 52.3	6.23	21 36.0
24	11 46 5.92	1.018	3 39 23.4	6.18	21 32.5
25	11 46 30.28	1.011	3 36 55.8	6.13	21 29.0
26	11 46 54.47	+1.004	+3 34 29.4	−6.08	21 25.5
27	11 47 18.48	0.997	3 32 4.3	6.03	21 21.9
28	11 47 42.32	0.990	3 29 40.5	5.97	21 18.4
29	11 48 5.99	0.982	3 27 18.0	5.91	21 14.9
30	11 48 29.46	0.974	3 24 56.9	5.85	21 11.4
31	11 48 52.73	+0.966	+3 22 37.2	−5.79	21 7.8
32	11 49 15.82	+0.958	+3 20 18.9	−5.73	21 4.3

Day of the Month.	6th.	14th.	22d.	30th.
Polar Semidiameter . .	7.5″	7.5″	7.5″	7.5″
Horizontal Parallax . .	0.9	0.9	0.9	0.9

Day of the Month.	8th.	16th.	24th.
Polar Semidiameter	7.6″	7.6″	7.6″
Horizontal Parallax	0.9	0.9	0.9

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	11 49 15.92	+0.958	+3 20 18.9	−5.73	21 4.3	1	11 58 56.22	+0.630	+2 24 27.8	−3.42	19 15.8
2	11 49 38.70	0.949	3 18 2.1	5.67	21 0.7	2	11 59 11.17	0.617	2 23 6.9	3.33	19 12.1
3	11 50 1.37	0.940	3 15 46.7	5.61	20 57.1	3	11 59 25.80	0.603	2 21 48.1	3.23	19 8.4
4	11 50 23.83	0.931	3 13 32.9	5.55	20 53.5	4	11 59 40.10	0.589	2 20 31.7	3.14	19 4.7
5	11 50 46.06	0.922	3 11 20.6	5.49	20 50.0	5	11 59 54.06	0.575	2 19 17.6	3.05	19 1.0
6	11 51 8.10	+0.913	+3 9 9.9	−5.42	20 46.4	6	12 0 7.68	+0.561	+2 18 5.8	−2.95	18 57.3
7	11 51 29.90	0.904	3 7 0.9	5.35	20 42.8	7	12 0 20.97	0.547	2 16 56.3	2.85	18 53.5
8	11 51 51.48	0.894	3 4 53.4	5.28	20 39.2	8	12 0 33.90	0.532	2 15 49.2	2.75	18 49.8
9	11 52 12.83	0.885	3 2 47.6	5.21	20 35.7	9	12 0 46.49	0.518	2 14 44.5	2.65	18 46.1
10	11 52 33.94	0.875	3 0 43.4	5.14	20 32.1	10	12 0 58.73	0.503	2 13 42.1	2.55	18 42.3
11	11 52 54.82	+0.865	+2 58 41.0	−5.07	20 28.5	11	12 1 10.63	+0.488	+2 12 42.1	−2.45	18 38.6
12	11 53 15.45	0.855	2 56 40.3	5.00	20 24.9	12	12 1 22.17	0.473	2 11 44.5	2.35	18 34.9
13	11 53 35.84	0.845	2 54 41.4	4.92	20 21.3	13	12 1 33.35	0.458	2 10 49.3	2.25	18 31.1
14	11 53 55.97	0.834	2 52 44.2	4.85	20 17.7	14	12 1 44.17	0.443	2 9 56.6	2.15	18 27.4
15	11 54 15.85	0.823	2 50 48.8	4.77	20 14.1	15	12 1 54.63	0.428	2 9 6.3	2.05	18 23.6
16	11 54 35.47	+0.812	+2 48 55.3	−4.69	20 10.5	16	12 2 4.73	+0.413	+2 8 18.5	−1.95	18 19.8
17	11 54 54.84	0.801	2 47 3.6	4.61	20 6.9	17	12 2 14.45	0.398	2 7 33.2	1.84	18 16.1
18	11 55 13.94	0.790	2 45 13.8	4.53	20 3.3	18	12 2 23.80	0.382	2 6 50.3	1.73	18 12.3
19	11 55 32.77	0.779	2 43 25.9	4.45	19 59.7	19	12 2 32.78	0.367	2 6 9.9	1.63	18 8.5
20	11 55 51.37	0.768	2 41 39.8	4.37	19 56.0	20	12 2 41.39	0.351	2 5 32.1	1.53	18 4.7
21	11 56 9.61	+0.756	+2 39 55.7	−4.29	19 52.4	21	12 2 49.62	+0.335	+2 4 56.8	−1.42	18 0.9
22	11 56 27.61	0.744	2 38 13.7	4.21	19 48.7	22	12 2 57.46	0.319	2 4 24.1	1.31	17 57.1
23	11 56 45.32	0.732	2 36 33.6	4.13	19 45.1	23	12 3 4.93	0.303	2 3 53.9	1.20	17 53.3
24	11 57 2.74	0.720	2 34 55.5	4.05	19 41.4	24	12 3 12.01	0.287	2 3 26.2	1.10	17 49.4
25	11 57 19.87	0.708	2 33 19.4	3.96	19 37.8	25	12 3 18.70	0.271	2 3 1.2	0.99	17 45.6
26	11 57 36.71	+0.696	+2 31 45.5	−3.87	19 34.1	26	12 3 25.00	+0.255	+2 2 38.7	−0.88	17 41.8
27	11 57 53.23	0.682	2 30 13.6	3.78	19 30.5	27	12 3 30.90	0.239	2 2 18.8	0.77	17 38.0
28	11 58 9.45	0.669	2 28 43.9	3.69	19 26.8	28	12 3 36.42	0.222	2 2 1.5	0.66	17 34.1
29	11 58 25.37	0.656	2 27 16.3	3.60	19 23.1	29	12 3 41.54	0.206	2 1 46.9	0.56	17 30.3
30	11 58 40.95	0.643	2 25 50.9	3.51	19 19.4	30	12 3 46.25	0.189	2 1 34.9	0.45	17 26.4
31	11 58 56.22	+0.630	+2 24 27.8	−3.42	19 15.8	31	12 3 50.57	+0.172	+2 1 25.5	−0.34	17 22.5
32	11 59 11.17	+0.617	+2 23 6.9	−3.33	19 12.1	32	12 3 54.49	+0.156	+2 1 18.7	−0.23	17 18.7

Day of the Month.	1st.	9th.	17th.	25th.	Day of the Month.	3d.	11th.	19th.	27th.	35th.
Polar Semidiameter . .	7.7″	7.8″	7.9″	8.0″	Polar Semidiameter . .	8.1″	8.2″	8.3″	8.4″	8.5″
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax . .	0.9	0.9	0.9	1.0	1.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	13 55 44.29	+7.102	-11 16 35.0	-37.50	19 9.3	July 4	13 42 7.20	-0.305	-10 0 56.5	- 0.58	6 52.1
5	13 56 11.18	6.337	11 18 56.5	33 23	18 54.0	8	13 42 7.57	+0.493	10 1 8.0	5.14	6 36.4
9	13 56 34.96	5.544	11 21 0.5	28.81	18 38.7	12	13 42 11.15	1.223	10 1 37.7	9.71	6 20.8
13	13 56 55.51	4.728	11 22 46.8	24.29	18 23.3	16	13 42 17.92	2.069	10 2 25.6	14.23	6 5.2
17	13 57 12.76	3.895	11 24 14.8	19.71	18 7.8	20	13 42 27.85	2.878	10 3 31.4	18 68	5 49.6
21	13 57 26.65	+3 053	-11 25 24.4	-15.10	17 52.3	24	13 42 40.93	+3.658	-10 4 54.9	-23.07	5 34.1
25	13 57 37.17	2.204	11 26 15.6	10.48	17 36.7	28	13 42 57.10	4.429	10 6 35.9	27.40	5 18.6
29	13 57 44.28	1.350	11 26 48.2	5.83	17 21.1	Aug. 1	13 43 16.34	5.191	10 8 34.0	31.66	5 3.2
Feb. 2	13 57 47.97	+0.491	11 27 2.3	- 1.19	17 5.4	5	13 43 38.61	5.939	10 10 49.1	35.83	4 47.9
6	13 57 48.22	-0.367	11 26 57.8	+ 3.45	16 49.7	9	13 44 3.84	6.667	10 13 20.5	39.86	4 32 6
10	13 57 45.05	-1.216	-11 26 34.8	+ 8.04	16 33.9	13	13 44 31.92	+7.370	-10 16 7.8	-43.74	4 17.3
14	13 57 38.51	2.050	11 25 53.6	12.52	16 18.0	17	13 45 2.77	8.048	10 19 10.2	47.43	4 2.1
18	13 57 28.68	2.861	11 24 54.7	16.90	16 2.1	21	13 45 36.27	8.699	10 22 27.0	50.95	3 46.9
22	13 57 15.65	3.645	11 23 38.6	21.11	15 46.2	25	13 46 12.33	9.326	10 25 57.6	54.32	3 31.8
26	13 56 59.55	4.402	11 22 6.0	25.16	15 30.2	29	13 46 50.84	9.927	10 29 41.4	57.53	3 16.7
Mar. 2	13 56 40.48	-5.128	-11 20 17.5	+29.06	15 14.1	Sept. 2	13 47 31.70	10.498	-10 33 37.6	-60.54	3 1.7
6	13 56 18.57	5.820	11 18 13.8	32.78	14 58.0	6	13 48 14.78	11.036	10 37 45 4	63.34	2 46.7
10	13 55 53.98	6.469	11 15 55.6	36.26	14 41.9	10	13 48 59.94	11.535	10 42 4.0	65.91	2 31.7
14	13 55 26.89	7.066	11 13 24.0	39.48	14 25.7	14	13 49 47.02	11.997	10 46 32.4	68.24	2 16.7
18	13 54 57.52	7.609	11 10 40.2	42.40	14 9.5	18	13 50 35.87	12.422	10 51 9.6	70.34	2 1.8
22	13 54 26.09	-8.096	-11 7 45.3	+45.00	13 53.3	22	13 51 26.34	12.811	-10 55 54.8	-72.22	1 46.9
26	13 53 52.82	8.526	11 4 40.6	47.30	13 37.0	26	13 52 18.31	13.164	11 0 47.1	73.90	1 32.1
30	13 53 17.95	8.898	11 1 27.3	49.30	13 20.7	30	13 53 11.61	13.479	11 5 45.7	75.34	1 17.2
Apr. 3	13 52 41.72	9.210	10 58 6.6	50.97	13 4.4	Oct. 4	13 54 6.08	13.750	11 10 49.5	76.52	1 2.4
7	13 52 4.36	9.456	10 54 40.0	52.28	12 48.0	8	13 55 1.55	13.975	11 15 57.5	77.44	0 47.6
11	13 51 26.16	-9.632	-10 51 8.9	+53.20	12 31.6	12	13 55 57.82	14.153	-11 21 8.6	-78.09	0 32.8
15	13 50 47.40	9.735	10 47 34.9	53.73	12 15.3	16	13 56 54.71	14 269	11 26 21.9	78.49	0 18.0
19	13 50 8.37	9.771	10 43 59.6	53.87	11 58.9	20	13 57 52.07	14.383	11 31 36.2	78.65	0 3.2 23 59.5
23	13 49 29.32	9.741	10 40 24.4	53.65	11 42.5	24	13 58 49.72	14 434	11 36 50.8	78.59	23 44.7
27	13 48 50.52	9.648	10 36 50.8	53.08	11 26.1	28	13 59 47.48	14.439	11 42 4.6	78.39	23 30.0
May 1	13 48 12.22	-9.491	-10 33 20.2	+52.16	11 9.8	Nov. 1	14 0 45.17	14.397	-11 47 16.7	-77.72	23 15.2
5	13 47 34.68	9.268	10 29 54.0	50.87	10 53.4	5	14 1 42.59	14.305	11 52 26 0	76 87	23 0.4
9	13 46 58.16	8.981	10 26 33.7	49.21	10 37.1	9	14 2 39.54	14.162	11 57 31.4	75.76	22 45.6
13	13 46 22.92	8.629	10 23 20.8	47.18	10 20.8	13	14 3 35.83	13.973	12 2 31.8	74 42	22 30.9
17	13 45 49.21	8.221	10 20 16.7	44.83	10 4.5	17	14 4 31.27	13.741	12 7 26.5	72.86	22 16.1
21	13 45 17.22	-7.763	-10 17 22 6	+42.19	9 48.3	21	14 5 25.70	13.465	-12 12 14.4	-71 08	22 1.2
25	13 44 47.17	7.258	10 14 39.5	39 28	9 32.0	25	14 6 18.93	13.142	12 16 54.8	69.07	21 46.4
29	13 44 19.22	6.709	10 12 8.6	36.13	9 15.9	29	14 7 10.77	12.771	12 21 26.6	66.82	21 31.5
June 2	13 43 53.56	6.115	10 9 50.8	32.72	8 59.1	Dec. 3	14 8 1.03	12 350	12 25 49.0	64.33	21 16.6
6	13 43 30.36	5.478	10 7 47.2	29.07	8 43.6	7	14 8 49.51	11.883	12 30 1.0	61.61	21 1.6
10	13 43 9.78	-4.805	-10 5 58.6	+25.20	8 27.5	11	14 9 36.04	11.375	-12 34 1.7	-58.69	20 46.7
14	13 42 51.95	4.103	10 4 25.8	21.15	8 11.5	15	14 10 20.46	10.827	12 37 50.3	55.61	20 31.7
18	13 42 36.99	3.377	10 3 9.5	16.98	7 55.5	19	14 11 2.61	10 242	12 41 26.3	52.36	20 16.6
22	13 42 24.96	2.632	10 2 10.1	12.72	7 39.6	23	14 11 42.34	9.616	12 44 49.0	48.93	20 1.6
26	13 42 15.95	1.873	10 1 27.9	8 37	7 23.7	27	14 12 19.49	8 951	12 47 57.6	45.32	19 46.5
30	13 42 10.00	-1.096	-10 1 3.3	+ 3.93	7 7.9	31	14 12 53.90	+8 249	-12 50 51.3	-41.55	19 31.3
July 4	13 42 7.20	-0.305	-10 0 56.5	- 0.58	6 52.1						

Greatest horizontal parallax,	April 20, 0″.51.	Greatest semidiameter,	April 20, 1″.92.
Least horizontal parallax,	October 24, 0″.45.	Least semidiameter,	October 24, 1″.73.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	4 11 22.53	−5.429	+19 25 22.1	−11.74	9 26.4	July 4	4 25 16.50	+8.116	+20 5 41.6	+17.10	21 33.0
5	4 11 1.57	5.045	19 24 37.4	10.59	9 10.3	8	4 25 48.39	7.822	20 6 48.1	16.14	21 17.8
9	4 10 42.22	4.623	19 23 57.5	9.34	8 54.3	12	4 26 19.04	7.498	20 7 50.7	15.16	21 2.6
13	4 10 24.63	4.171	19 23 22.8	8.00	8 38.3	16	4 26 48.34	7.149	20 8 49.3	14.14	20 47.3
17	4 10 8.89	3.693	19 22 53.6	6.60	8 22.3	20	4 27 16.20	6.776	20 9 43.8	13.09	20 32.0
21	4 9 55.12	−3.191	+19 22 30.1	−5.15	8 6.3	24	4 27 42.52	+6.381	+20 10 34.0	+12.01	20 16.7
25	4 9 43.39	2.670	19 22 12.6	3.67	7 50.4	28	4 28 7.22	5.964	20 11 19.8	10.88	20 1.4
29	4 9 33.78	2.136	19 22 1.0	2.16	7 34.6	Aug. 1	4 28 30.20	5.522	20 12 1.0	9.73	19 46.1
Feb. 2	4 9 26 33	1.584	19 21 55.4	−0.62	7 18.7	5	4 28 51.37	5.058	20 12 37.6	8.55	19 30.7
6	4 9 21.13	1.017	19 21 56.1	+0.95	7 2.9	9	4 29 10.64	4.572	20 13 9.4	7.37	19 15.3
10	4 9 18.20	−0.445	+19 22 3.0	+2.51	6 47.1	13	4 29 27.93	+4.072	+20 13 36.5	+6.15	18 59.8
14	4 9 17.58	+0.134	19 22 16.2	4.09	6 31.4	17	4 29 43.20	3.558	20 13 58.6	4.92	18 44.3
18	4 9 19.28	0.712	19 22 35.7	5.64	6 15.7	21	4 29 56.38	3.032	20 14 15.9	3.71	18 28.8
22	4 9 23.28	1.285	19 23 1.3	7.17	6 0.0	25	4 30 7.44	2.495	20 14 28.3	2.49	18 13.3
26	4 9 29.56	1.856	19 23 33.0	8.64	5 44.4	29	4 30 16.32	1.944	20 14 35.8	1.26	17 57.7
Mar. 2	4 9 38.12	+2.420	+19 24 10.4	+10.08	5 28.8	Sept. 2	4 30 22.98	+1.386	+20 14 38.4	+0.02	17 42.1
6	4 9 48.91	2.977	19 24 53.6	11.51	5 13.2	6	4 30 27.39	0.821	20 14 36.0	−1.22	17 26.4
10	4 10 1.92	3.524	19 25 42.4	12.87	4 57.7	10	4 30 29.54	+0.257	20 14 28.7	2.43	17 10.7
14	4 10 17.08	4.054	19 26 36.5	14.16	4 42.3	14	4 30 29.45	−0.304	20 14 16.6	3.61	16 55.0
18	4 10 34.33	4.566	19 27 35.6	15.37	4 26.8	18	4 30 27.11	0.862	20 14 0.0	4.77	16 39.2
22	4 10 53.58	+5.058	+19 28 39.4	+16.54	4 11.4	22	4 30 22.56	−1.415	+20 13 38.7	−5.91	16 23.4
26	4 11 14.77	5.531	19 29 47.7	17.60	3 56.1	26	4 30 15.80	1.961	20 13 12.8	7.03	16 7.6
30	4 11 37.80	5.981	19 31 0.1	18.59	3 40.7	30	4 30 6.89	2.495	20 12 42.5	8.10	15 51.7
Apr. 3	4 12 2.59	6.411	19 32 16.3	19.50	3 25.4	Oct. 4	4 29 55 86	3.016	20 12 8.0	9.13	15 35.8
7	4 12 29.06	6.820	19 33 36.0	20.34	3 10.1	8	4 29 42.79	3.516	20 11 29.5	10.11	15 19.8
11	4 12 57.11	+7.199	+19 34 58.9	+21.08	2 54.8	12	4 29 27.76	−3.996	+20 10 47.2	−11.03	15 3.8
15	4 13 26.61	7.547	19 36 24.5	21.73	2 39.6	16	4 29 10.86	4.448	20 10 1.3	11.90	14 47.8
19	4 13 57.45	7.867	19 37 52.6	22.28	2 24.4	20	4 28 52.21	4 873	20 9 12.1	12.70	14 31.8
23	4 14 29.51	8.160	19 39 22.6	22.72	2 9.2	24	4 28 31.91	5.273	20 8 19.8	13.43	14 15.7
27	4 15 2.69	8.424	19 40 54.3	23.10	1 54.0	28	4 28 10.07	5.641	20 7 24.7	14.11	13 59.6
May 1	4 15 36.86	+8.657	+19 42 27.3	+23.39	1 38.8	Nov. 1	4 27 46.83	−5.974	+20 6 27.0	−14.71	13 43.5
5	4 16 11.91	8.863	19 44 1.3	23.59	1 23.7	5	4 27 22.33	6.268	20 5 27.2	15.20	13 27.4
9	4 16 47.72	9.037	19 45 35.9	23.70	1 8.6	9	4 26 56.74	6.519	20 4 25.7	15.59	13 11.2
13	4 17 24.16	9.176	19 47 10.8	23.73	0 53.4	13	4 26 30.23	6.729	20 3 22.7	15.86	12 55.0
17	4 18 1.08	9.280	19 48 45.6	23.64	0 38.3	17	4 26 2.96	6.898	20 2 18.8	16.08	12 38.9
21	4 18 38.36	+9.355	+19 50 19.8	+23.47	0 23.2	21	4 25 35.10	−7.025	+20 1 14.2	−16.21	12 22.7
25	4 19 15.88	9.400	19 51 53.3	23.25	0 8.1	25	4 25 6.82	7.107	20 0 9.3	16.22	12 6.5
29	4 19 53.52	9.414	19 53 25.7	22.95	23 49.2	29	4 24 38.31	7.140	19 59 4.6	16.12	11 50.3
June 2	4 20 31.15	9.395	19 54 56.8	22.57	23 34.1	Dec. 3	4 24 9.76	7.127	19 58 0.5	15.90	11 34.1
6	4 21 8.64	9.346	19 56 26.2	22.11	23 19.0	7	4 23 41.36	7.064	19 56 57.6	15.58	11 17.9
10	4 21 45.87	+9.262	+19 57 53.6	+21.57	23 3.9	11	4 23 13.31	−6.955	+19 55 56.0	−15.16	11 1.7
14	4 22 22.69	9.144	19 59 18.7	20.97	22 48.8	15	4 22 45.78	6.801	19 54 56.5	14.62	10 45.5
18	4 22 58.98	8.996	20 0 41.3	20.31	22 33.6	19	4 22 18.96	6.606	19 53 59.3	13.98	10 29.3
22	4 23 34.62	8.820	20 2 1.1	19.57	22 18.5	23	4 21 52.99	6.370	19 53 4.8	13.24	10 13.2
26	4 24 9.50	8.615	20 3 17.8	18.79	22 3.3	27	4 21 28.06	6.098	19 52 13.5	12.42	9 57.0
30	4 24 43.50	+8.380	+20 4 31.4	+17.99	21 48.2	31	4 21 4.34	−5.785	+19 51 25.6	−11.50	9 40.9
July 4	4 25 16.50	+8.116	+20 5 41.6	+17.10	21 33.0						

Greatest horizontal parallax,	November 29, 0″.31.	Greatest semidiameter,	November 29, 1″.33.
Least horizontal parallax,	May 29, 0″.29.	Least semidiameter,	May 29, 1″.25.

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. –1	26 22 51.8	5 34 42.5	– 8 31.2	–2 28 51.6	+38 24.0	9.5146418	9.9721682	9.9598419
1	37 49 9.1	5 51 14.7	– 4 5.1	–1 7 37.5	42 34.4	9.5038485	9.9471612	9.9342133
3	49 46 1 4	6 5 3.4	+ 1 13.7	+0 20 7.5	44 47.4	9.4953969	9.9211134	9.9080086
5	62 6 37.4	6 14 45.1	6 29.2	1 49 47.6	44 24.2	9.4899179	9.8950744	9.8825179
7	74 41 29.4	6 19 9.1	10 36.5	3 15 47.9	41 7.0	9.4878657	9.8705711	9.8594834
9	87 19 15.1	6 17 35.8	+12 42.4	+4 32 28.7	+35 9.6	9.4894203	9.8495101	9.8408948
11	99 47 56.5	6 10 9.4	12 23.3	5 35 8.2	27 15.2	9.4944447	9.8338527	9.8285523
13	111 56 29.0	5 57 38.4	9 51.8	6 20 51.9	18 24.3	9.5025180	9.8251009	9.8235361
15	123 36 0.4	5 41 23.2	5 47.8	6 48 47.7	9 37.0	9.5130264	9.8238237	9.8258659
17	134 40 32.6	5 22 54.4	+ 1 3.2	6 59 49.9	+ 1 38.6	9.5252797	9.8295104	9.8345691
19	145 7 5.4	5 3 36.5	– 3 34.2	+6 56 3.1	– 5 10.0	9.5386049	9.8408346	9.8480931
21	154 55 9.8	4 44 35.1	7 30.1	6 40 4.2	10 26.4	9.5524148	9.8561378	9.8647783
23	164 6 7.2	4 26 35.5	10 24.4	6 14 33.3	14 43.5	9.5662326	9.8738440	9.8831879
25	172 42 30.8	4 10 4.1	12 10.9	5 41 55.3	17 44.5	9.5796944	9.8926861	9.9022358
27	180 47 30.9	3 55 13.4	12 51.4	5 4 13.3	19 40.6	9.5925358	9.9117540	9.9211753
29	188 24 33.5	3 42 6.1	–12 33.9	+4 23 5.9	–21 11.4	9.6045732	9.9304483	9.9395352
31	195 37 2.1	3 30 38.8	11 28.3	3 39 50.2	21 50.5	9.6156853	9.9484072	9.9570439
Feb. 2	202 28 11.7	3 20 45.9	9 45 6	2 55 24.8	22 22.2	9.6257960	9.9654316	9.9735627
4	209 1 3.6	3 12 19.8	7 35.8	2 10 33.8	22 26.0	9.6348619	9.9814325	9.9890401
6	215 18 24.1	3 5 13.4	5 8.6	1 25 50.0	22 15.8	9.6428608	9.9963873	0.0034776
8	221 22 45.3	2 59 19.4	– 2 32.2	+0 41 37.7	–21 55.1	9.6497855	0.0103155	0.0169069
10	227 16 25.8	2 54 31.7	+ 0 6.4	–0 1 44.9	21 26.3	9.6556369	0.0232582	0.0293762
12	233 1 32.8	2 50 45.2	2 40.9	0 44 3.5	20 51.4	9.6604207	0.0352682	0.0409415
14	238 40 4.5	2 47 55.6	5 6.0	1 25 7.2	20 11.5	9.6641448	0.0464030	0.0516596
16	244 13 50.6	2 45 59.2	7 17.4	2 4 46.6	19 27.2	9.6668167	0.0567183	0.0615857
18	249 44 35.6	2 44 54.2	+ 9 11.5	–2 42 53.1	–18 38.7	9.6684428	0.0662678	0.0707710
20	255 14 0.3	2 44 38.6	10 44.6	3 19 18.4	17 45.9	9.6690273	0.0751004	0.0792609
22	260 43 42.7	2 45 12.0	11 53.9	3 53 53.5	16 48.4	9.6685717	0.0832574	0.0870942
24	266 15 20.9	2 46 34.4	12 37.2	4 26 28.3	15 45.4	9.6670747	0.0907752	0.0943037
26	271 50 33.6	2 48 46.8	12 52.3	4 56 50.9	14 36.0	9.6645326	0.0976825	0.1009138
28	277 31 2.5	2 51 50.8	+12 37.7	–5 24 47.2	–13 18.8	9.6609393	0.1040001	0.1069425
Mar. 2	283 18 33.3	2 55 49.4	11 52.4	5 49 59.8	11 52.1	9.6562871	0.1097418	0.1123967
4	289 14 58.7	3 0 45.8	10 35.8	6 12 7.9	10 13.9	9.6505678	0.1149129	0.1172838
6	295 22 17.7	3 6 43.8	8 48.4	6 30 45.9	8 21.4	9.6437761	0.1195097	0.1215887
8	301 42 38.5	3 13 48.6	6 32.4	6 45 22.9	6 12.2	9.6359095	0.1235182	0.1252946
10	308 18 20.3	3 22 5.5	+ 3 50.8	–6 55 21.7	– 3 42.8	9.6269743	0.1269137	0.1283704
12	315 11 52 5	3 31 40.1	+ 0 49.3	6 59 58.2	– 0 49.3	9.6169904	0.1296585	0.1307712
14	322 25 56.3	3 42 38.0	– 2 24.1	6 58 20.5	+ 2 38.0	9.6059983	0.1317003	0.1324366
16	330 3 22.9	3 55 3.6	5 37.9	6 49 29.3	6 24.8	9.5940692	0.1329697	0.1332879
18	338 7 10.5	4 8 59.0	8 37.0	6 32 18.8	10 51.5	9.5813181	0.1333783	0.1332263
20	346 40 17.7	4 24 22.7	–11 2.6	–6 5 40.3	+15 52.6	9.5679201	0.1328160	0.1321302
22	355 45 33.6	4 41 5.6	12 33.2	5 28 28.0	21 24.2	9.5541281	0.1311500	0.1298551
24	5 25 21.3	4 58 50.1	12 47.3	4 39 50.1	27 15.8	9.5402933	0.1282242	0.1262348
26	15 41 13.9	5 17 4.0	11 27.5	3 39 24.6	33 7.6	9.5268781	0.1238632	0.1210857
28	26 33 24.7	5 34 58.8	8 27.8	2 27 40.2	38 28.7	9.5144574	0.1178790	0.1142194
30	38 0 13.0	5 51 29.2	– 4 0.3	–1 6 16.1	+42 37.5	9.5036948	0.1100846	0.1054549
32	49 57 31.6	6 5 14.6	+ 1 18.8	+0 21 30.9	+44 48.3	9.4952847	0.1003138	0.0946473

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	49 57 31.6	6 5 14.8	+ 1 18.8	+0 21 30.9	+44 48.3	9.4952847	0.1003136	0.0946473
3	62 18 26.4	6 14 52.0	6 33.5	1 51 10.3	44 22.5	9.4898557	0.0884460	0.0817058
5	74 53 26.9	6 19 10.7	10 39.4	3 17 4.6	41 2.7	9.4878587	0.0744280	0.0666196
7	87 31 10.2	6 17 31.8	12 43.2	4 33 34.2	35 3.0	9.4894689	0.0582935	0.0494676
9	99 59 38.1	6 10 0.0	12 21.9	5 35 59.0	27 7.3	9.4945449	0.0401652	0.0304140
11	112 7 47.4	5 57 24.8	+ 9 48.6	+6 21 26.1	+18 16.0	9.5026610	0.0202453	0.0096941
13	123 46 48.3	5 41 6.7	5 43.7	6 49 5.5	9 28.5	9.5132028	9.9987973	9.9875935
15	134 50 46.1	5 22 36.5	+ 0 58.8	6 59 52.8	+ 1 29.6	9.5254776	9.9761230	9.9644276
17	145 16 42.5	5 3 18.2	− 3 38.2	6 55 53.4	− 5 15.7	9.5388153	9.9525499	9.9405327
19	155 4 11.2	4 44 17.6	7 33.3	6 39 44.4	10 30.8	9.5526292	9.9284195	9.9162562
21	164 14 34.7	4 26 19.2	−10 26.6	+6 14 5.6	−14 46.8	9.5664446	9.9040689	9.8919653
23	172 50 27.3	4 9 40.4	12 12.0	5 41 22.1	17 46.5	9.5798991	9.8799352	9.8680501
25	180 54 59.7	3 55 0.2	12 51.6	5 3 36.3	19 51.2	9.5927296	9.8563629	9.8449295
27	188 31 37.3	3 41 54.4	12 33.2	4 22 26.4	21 12.3	9.6047539	9.8338078	9.8230577
29	195 43 44.3	3 30 28.7	11 27.0	3 39 9.3	22 0.0	9.6158571	9.8127404	9.8029182
May 1	202 34 35.1	3 20 37.3	− 9 43.6	+2 54 43.2	−22 22.4	9.6259460	9.7936534	9.7850075
3	209 7 11.4	3 12 12.7	7 33.8	2 9 52.0	22 26.2	9.6349957	9.7770413	9.7698122
5	215 24 18.7	3 5 7.3	5 6.2	1 25 8.5	22 15.5	9.6429780	9.7633726	9.7577693
7	221 28 29.0	2 59 14.4	− 2 29.8	+0 40 56.9	21 54.6	9.6498861	9.7530425	9.7492232
9	227 22 0.5	2 54 28.0	+ 0 8.9	−0 2 24.8	21 26.6	9.6557209	9.7463332	9.7443845
11	233 7 0.6	2 50 42.2	+ 2 43.3	−0 44 42.3	−20 50.8	9.6604881	9.7433781	9.7433052
13	238 45 27.0	2 47 53.4	5 8.2	1 25 44.8	20 10.9	9.6641956	9.7441465	9.7458727
15	244 19 9.7	2 45 57.8	7 19.3	2 5 22.8	19 26.4	9.6668510	9.7484480	9.7518283
17	249 49 52.5	2 44 53.5	9 13.0	2 43 27.8	18 37.9	9.6684608	9.7559653	9.7608070
19	255 19 16.9	2 44 36.8	10 45.8	3 19 51.5	17 45.0	9.6690289	9.7662974	9.7723804
21	260 49 0.4	2 45 12.9	+11 54.8	−3 54 24.7	−16 47.4	9.6685569	9.7789994	9.7860994
23	266 20 41.1	2 46 36.0	12 37.6	4 26 57.6	15 44.4	9.6670436	9.7936271	9.8015321
25	271 55 57.8	2 48 49.2	12 52.3	4 57 18.1	14 34.9	9.6644852	9.8097661	9.8182846
27	277 36 32.2	2 51 54.1	12 37.2	5 25 11.9	13 17.5	9.6608753	9.8270462	9.8360127
29	283 24 10.5	2 55 53.6	11 51.3	5 50 21.8	11 50.7	9.6562064	9.8451500	9.8544262
31	289 20 45.0	3 0 50.8	+10 34.3	−6 12 26.9	−10 12.2	9.6504706	9.8638126	9.8732831
June 2	295 28 15.0	3 6 49.8	8 46.6	6 31 1.4	8 19.7	9.6436620	9.8828144	9.8923858
4	301 48 48.9	3 13 55.7	6 30.2	6 45 34.4	6 10.2	9.6357785	9.9019778	9.9115724
6	308 24 46.0	3 22 13.8	3 48.2	6 55 28.6	3 40.3	9.6268268	9.9211540	9.9307067
8	315 18 36.1	3 31 40.8	+ 0 46.4	6 59 59.7	− 0 48.4	9.6168268	9.9402169	9.9496708
10	322 33 0.6	3 42 48.9	− 2 27.3	−6 58 15.8	+ 2 36.6	9.6058193	9.9590548	9.9683558
12	330 10 50.2	3 55 15.8	5 40.9	6 49 17.3	6 28.6	9.5938763	9.9775608	9.9866562
14	338 15 3.8	4 9 12.8	8 39.5	6 31 58.5	10 56.9	9.5811139	9.9956278	0.0044609
16	346 48 39.9	4 24 37.5	11 4.5	6 5 10.6	15 57.6	9.5677076	0.0131400	0.0216484
18	355 54 27.0	4 41 21.8	12 34.0	5 27 48.1	21 29.5	9.5539122	0.0299685	0.0380607
20	5 34 48.1	4 59 7.1	−12 46.8	−4 38 59.2	+27 21.3	9.5400802	0.0459651	0.0535999
22	15 51 14.8	5 17 21.0	11 25.5	3 38 22.8	33 12.9	9.5266758	0.0609627	0.0680294
24	26 43 59.4	5 35 15.2	8 24.3	2 26 28.4	38 33.2	9.5142760	0.0747750	0.0811746
26	38 11 18.7	5 51 43.6	− 3 55.7	−1 4 58.7	42 40.6	9.5035449	0.0872036	0.0926380
28	50 9 3.3	6 5 20.0	+ 1 23.9	+0 22 54.5	44 49.2	9.4951764	0.0980547	0.1026330
30	62 30 15.7	6 14 58.6	+ 6 38.1	+1 52 33.0	+44 20.7	9.4897960	0.1071554	0.1110073
32	75 5 24.0	6 19 12.1	+10 42.5	+3 18 21.0	+40 58.3	9.4878565	0.1143784	0.1172634

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	75 5 24.0	6 19 12 1	+10 42.5	+3 18 21.0	+40 58.3	9.4878565	0.1143784	0.1172634
4	87 43 4.5	6 17 27.4	12 44.0	4 34 39.5	34 56.4	9.4895222	0.1196615	0.1215763
6	100 11 18.1	6 9 50.3	12 20.6	5 36 49.5	26 59.2	9.4946492	0.1230161	0.1239937
8	112 19 3.8	5 57 41.0	9 45.5	6 22 0.0	18 7.6	9.5028085	0.1245244	0.1246273
10	123 57 34.2	5 40 50.2	5 39.4	6 49 23.1	9 20.6	9.5133827	0.1243231	0.1236335
12	135 0 57.6	5 22 19.5	+ 0 54.3	+6 59 55.5	+ 1 22.7	9.5256792	0.1225816	0.1211904
14	145 26 17.9	5 3 0.2	− 3 42.2	6 55 43.5	− 5 21.3	9.5390287	0.1194820	0.1174785
16	155 13 11.2	4 44 0.2	7 36.5	6 39 24.5	10 44.0	9.5528460	0.1152005	0.1126671
18	164 22 1.1	4 26 2.9	10 28.8	6 13 38.1	14 50.1	9.5666584	0.1098968	0.1069060
20	172 58 22.7	4 9 34.9	12 13.1	5 40 49.0	17 48.9	9.5801050	0.1037095	0.1003209
22	181 2 27.8	3 54 47.3	−12 51.8	+5 2 59.3	−19 52.8	9.5929242	0.0967524	0.0930145
24	188 38 40.8	3 41 42.9	12 32.5	4 21 46.9	21 13.3	9.6049348	0.0891171	0.0850682
26	195 50 26.3	3 30 18.8	11 25.6	3 38 28.3	22 0.5	9.6160167	0.0808747	0.0765423
28	202 40 58.8	3 20 28.8	9 41.8	2 54 1.6	22 22.6	9.6260953	0.0720765	0.0674811
30	209 13 19.3	3 12 5.4	7 31.5	2 9 10.4	22 26.0	9.6351282	0.0627594	0.0579138
Aug. 1	215 30 13.3	3 5 1.2	− 5 3.8	+1 24 27.1	−22 15.3	9.6430937	0.0529461	0.0478577
3	221 34 12.3	2 59 9.5	− 2 27.2	+0 40 16.1	21 54.2	9.6499847	0.0426493	0.0373206
5	227 27 35.4	2 54 23.9	+ 0 11.2	−0 3 4.6	21 25.3	9.6558024	0.0318717	0.0263021
7	233 12 28.4	2 50 39.1	2 45.6	0 45 21.1	20 50.2	9.6605527	0.0206112	0.0147975
9	238 50 49.6	2 47 51.2	5 10.4	1 26 22.3	20 10.2	9.6642436	0.0088600	0.0027973
11	244 24 28.6	2 45 56.5	+ 7 21.2	−2 5 58.9	−19 25.7	9.6668825	9.9966083	9.9902915
13	249 55 9.6	2 44 53.0	9 14.6	2 44 2.4	18 37.1	9.6684759	9.9838461	9.9772712
15	255 24 33.5	2 44 39.0	10 47.1	3 20 24.5	17 44.2	9.6690278	9.9705666	9.9637328
17	260 54 18.1	2 45 13.8	11 55.7	3 54 56.0	16 46.5	9.6685397	9.9567708	9.9496825
19	266 26 1.3	2 46 38.0	12 38.2	4 27 26.9	15 43.4	9.6670100	9.9424711	9.9351413
21	272 1 22.2	2 48 51.7	+12 52.3	−4 57 45.2	−14 33.7	9.6644354	9.9276996	9.9201545
23	277 42 2.6	2 51 57.5	12 36.7	5 25 36.7	13 16.3	9.6608093	9.9125172	9.9048021
25	283 29 48.4	2 55 57.8	11 50.4	5 50 48.9	11 49.2	9.6561242	9.8970274	9.8892151
27	289 26 32.3	3 0 56.0	10 32.8	6 12 45.9	10 10.6	9.6503720	9.8813929	9.8735937
29	295 34 13.5	3 6 56.0	8 44.7	6 31 16.9	8 17.8	9.6435471	9.8658576	9.8582325
31	301 55 0.8	3 14 3.0	+ 6 27.8	−6 45 45.9	− 6 8.1	9.6356474	9.8507736	9.8435459
Sept. 2	308 31 13.7	3 22 22.2	3 45.4	6 55 35.5	3 37.8	9.6266798	9.8366245	9.8300938
4	315 25 21.7	3 31 59.2	+ 0 43.4	7 0 1.1	− 0 43.5	9.6166644	9.8240488	9.8185933
6	322 40 6.4	3 42 59.8	− 2 30.1	6 58 10.9	+ 2 38.7	9.6056424	9.8138386	9.8099018
8	330 18 19.5	3 55 28.2	5 43.8	6 49 5.2	6 32.5	9.5936864	9.8069009	9.8049522
10	338 22 59.1	4 9 26.4	− 8 42.1	−6 31 38.1	+11 0.4	9.5809127	9.8041644	9.8046320
12	346 57 3.8	4 24 52.5	11 6.4	6 4 40.8	16 2.5	9.5674987	9.8064295	9.8096075
14	356 3 22.1	4 41 37.8	12 34.9	5 27 7.9	21 34.8	9.5537002	9.8141857	9.8201521
16	5 44 15.8	4 59 23.7	12 46.3	4 38 8.2	27 26.7	9.5398714	9.8274613	9.8360369
18	16 1 16.0	5 17 37.8	11 23.3	3 37 20.9	33 18.2	9.5264779	9.8457735	9.8565425
20	26 54 33.4	5 35 31.2	− 8 20.7	−2 25 16.6	+38 37.8	9.5140986	9.8681972	9.8805804
22	38 22 22.8	5 51 57.5	− 3 51.1	−1 3 39.4	42 43.5	9.5033986	9.8935296	9.9068823
24	50 20 31.9	6 5 36.6	+ 1 28.9	+0 24 17.7	44 50.0	9.4950717	9.9204813	9.9341787
26	62 42 1.8	6 15 4.9	6 42.5	1 53 55.3	44 18.9	9.4897432	9.9478386	9.9613390
28	75 17 17.3	6 19 12.9	10 45.3	3 19 36.9	40 53.8	9.4878565	9.9745743	9.9874547
30	87 54 53.8	6 17 22.7	+12 44.7	+4 35 44.1	+34 49.7	9.4895771	9.9999071	0.0118733
32	100 22 52.6	6 9 40.2	+12 19.1	+5 37 39.3	+26 51.3	9.4947541	0.0233111	0.0341914

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	100 22 52.6	6 9 40.2	+12 19.1	+5 37 39.3	+26 51.3	9.4947541	0.0233111	0.0341914
4	112 30 13.6	5 56 57.2	9 42.2	6 22 33.6	17 59.3	9.5029550	0.0444978	0.0542231
6	124 8 14.5	5 40 34 1	5 35.2	6 49 40.2	9 12 8	9.5135602	0.0633691	0.0719457
8	135 11 3.2	5 22 0.8	+ 0 49.8	6 59 58.0	+ 1 15.9	9.5258773	0.0799667	0.0874509
10	145 35 47.6	5 2 42.3	− 3 46.2	6 55 33.5	− 5 27.0	9.5392378	0.0944192	0.1008948
12	155 22 5.5	4 43 43.0	− 7 39.6	+6 39 4.6	−10 48.6	9.5530578	0.1069018	0.1124642
14	164 31 22.0	4 25 47.0	10 30.9	6 13 10.7	14 53.3	9.5668669	0.1176056	0.1223488
16	173 6 13.5	4 9 20.4	12 14.2	5 40 16.1	17 51.2	9.5803053	0.1267163	0.1307290
18	181 9 50.9	3 54 34.4	12 51.8	5 2 22.6	19 54.3	9.5931131	0.1344067	0.1377676
20	188 45 40.0	3 41 31.7	12 31.9	4 21 7.7	21 14.2	9.6051099	0.1408290	0.1436061
22	195 57 4.4	3 30 9.0	−11 24.3	+3 37 47.8	−22 1.0	9.6161768	0.1461138	0.1483650
24	202 47 18.6	3 20 20.4	9 39.9	2 53 20.3	22 22.8	9.6262399	0.1503719	0.1521453
26	209 19 23.7	3 11 58.4	7 29.2	2 8 29.0	22 25.8	9.6352563	0.1536949	0.1550294
28	215 36 4.8	3 4 55.4	5 1.3	1 23 46.1	22 15.0	9.6432054	0.1561568	0.1570842
30	221 39 53.4	2 59 4.7	− 2 24.7	+0 39 35.7	21 53.9	9.6500798	0.1578179	0.1583629
Nov. 1	227 33 7.7	2 54 20.1	+ 0 13.7	−0 3 44.2	−21 24.8	9.6558813	0.1587240	0.1589054
3	233 17 54.2	2 50 36.2	2 47.8	0 45 59.6	20 49.7	9.6606154	0.1589103	0.1587412
5	238 56 10.3	2 47 49.1	5 12.6	1 26 59.6	20 9.6	9.6642902	0.1584004	0.1578895
7	244 29 46.1	2 45 55.2	7 23.2	2 6 34.9	19 25.0	9.6669131	0.1572096	0.1563609
9	250 0 25.2	2 44 52.4	9 16.3	2 44 36.9	18 36.3	9.6684908	0.1553434	0.1541567
11	255 29 48.7	2 44 39.2	+10 48.4	−3 20 57.3	−17 43.4	9.6690270	0.1527996	0.1512705
13	260 59 34.5	2 45 14.7	11 56.6	3 55 27.1	16 45.6	9.6685232	0.1495669	0.1476863
15	266 31 20.3	2 46 39.4	12 38.6	4 27 56.0	15 42.4	9.6669780	0.1456256	0.1433808
17	272 6 45.3	2 48 54.1	12 52.3	4 58 12.2	14 32.6	9.6643878	0.1409473	0.1383202
19	277 47 31.3	2 52 0.7	12 36.2	5 26 1.2	13 15.0	9.6607460	0.1354940	0.1324621
21	283 35 24.4	2 56 1.8	+11 49.4	−5 51 5.8	−11 47.8	9.6560450	0.1292176	0.1257529
23	289 32 17.0	3 1 0.8	10 31.4	6 13 4.7	10 9.0	9.6502771	0.1220595	0.1181285
25	295 40 9.0	3 7 1.9	8 42.8	6 31 32.2	8 16.0	9.6434362	0.1139500	0.1095130
27	302 1 9.2	3 14 9.8	6 25.5	6 45 57.2	6 5 9	9.6355207	0.1048056	0.0998160
29	308 37 36.6	3 22 30.0	3 42.8	6 55 42.1	3 35.3	9.6265374	0.0945309	0.0889363
Dec. 1	315 32 1.6	3 32 8.4	+ 0 40.5	−7 0 2.4	− 0 40.6	9.6165067	0.0830174	0.0767583
3	322 47 5.9	3 43 10.2	− 2 33.2	6 58 6.0	+ 2 42.0	9.6054702	0.0701437	0.0631567
5	330 25 41.1	3 55 39.8	5 46.6	6 48 53.1	6 36.3	9.5935009	0.0557807	0.0479994
7	338 30 45.3	4 9 39.4	8 44.6	6 31 17.9	11 4.6	9.5807167	0.0397968	0.0311583
9	347 5 17.3	4 25 6.6	11 8.2	6 4 11.5	16 7.3	9.5672950	0.0220715	0.0125269
11	356 12 4.8	4 41 52.0	−12 25.7	−5 26 28.6	+21 40.0	9.5534933	0.0025205	9.9920530
13	5 53 29.7	4 59 39.6	12 45.7	4 37 18.5	27 32.2	9.5396672	9.9811345	9.9697865
15	16 11 1.9	5 17 53.8	11 21.3	3 36 20.5	33 23.4	9.5262847	9.9580447	9.9459623
17	27 4 50.8	5 35 46.4	8 17.3	2 24 6.7	38 42.0	9.5139256	9.9336147	9.9211036
19	38 33 8.9	5 52 11.0	− 3 46.5	−1 2 22.2	42 46.4	9.5032560	9.9085602	9.8961489
21	50 31 42.2	6 5 46.8	+ 1 33.8	+0 25 38.6	+44 50.8	9.4949697	9.8840668	9.8725430
23	62 53 27.8	6 15 10.7	6 46.9	1 55 15.1	44 16.8	9.4896900	9.8618324	9.8522035
25	75 28 50.5	6 19 13.8	10 48.1	3 20 50.5	40 49.4	9.4878570	9.8439235	9.8372376
27	88 6 23.1	6 17 18.1	12 45.4	4 36 46.8	34 43.2	9.4896312	9.8323473	9.8293918
29	100 34 8.0	6 9 31.2	12 17.6	5 38 27.5	26 43.4	9.4948575	9.8284322	9.8294480
31	112 41 7.2	5 56 44.1	+ 9 39.0	+6 23 5.5	+17 51.2	9.5030990	9.8323381	9.8369381
33	124 18 38.1	5 40 17.9	+ 5 31.1	+6 49 56.7	+ 9 5.4	9.5137350	9.8430375	9.8503997

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	117 49 28.7	1 37 24.4	+3 0.1	+2 16 39.2	+4 16.6	9.8564333	9.5614632	9.5759595
5	124 19 13.8	1 37 28 0	2 59.5	2 32 51.1	3 48.8	9.8563823	9.5904180	9.6047803
9	130 49 11.6	1 37 30.6	2 49.7	2 47 5.5	3 17.8	9.8563685	9.6189998	9.6330416
13	137 19 17.5	1 37 32.1	2 31.3	2 59 11.2	2 44.4	9.8563927	9.6468815	9.6605004
17	143 49 26.6	1 37 32.2	2 5.0	3 8 58.6	2 8.9	9.8564544	9.6738820	9.6870189
21	150 19 33.3	1 37 30.9	+1 32.4	+3 16 20.3	+1 31.7	9.8565529	9.6999050	9.7125347
25	156 49 32.3	1 37 28 3	0 55.1	3 21 10.7	0 53.4	9.8566866	9.7249062	9.7370177
29	163 19 17.7	1 37 24.2	+0 15.0	3 23 26.2	+0 14.4	9.8568538	9.7488678	9.7604584
Feb. 2	169 48 44.4	1 37 18.8	−0 26.0	3 23 5.4	−0 24.7	9.8570524	9.7717915	9.7828697
6	176 17 46.6	1 37 12.1	1 5.4	3 20 9.0	1 3.4	9.8572798	9.7936989	9.8042843
10	182 46 19.5	1 37 4.2	−1 41.4	+3 14 39.7	−1 41.0	9.8575329	9.8146325	9.8247506
14	189 14 19.1	1 36 55.4	2 12.4	3 6 42.5	2 17.3	9.8578085	9.8346461	9.8443263
18	195 41 41.4	1 36 45.6	2 36.6	2 56 23.9	2 51.6	9.8581029	9.8537978	9.8630672
22	202 8 23.4	1 36 35.3	2 52.9	2 43 52.6	3 23.6	9.8584125	9.8721398	9.8810210
26	208 34 23.0	1 36 24.7	3 0.4	2 29 18.5	3 52.9	9.8587331	9.8897147	9.8982250
Mar. 2	214 59 39.0	1 36 13.7	−2 58.9	+2 12 53.3	−4 19.1	9.8590608	9.9065557	9.9147118
6	221 24 11.0	1 36 2.6	2 48.5	1 54 49.9	4 42.0	9.8593914	9.9226960	9.9305140
10	227 47 59.7	1 35 51.8	2 29.8	1 35 22.5	5 1.2	9.8597207	9.9381703	9.9456696
14	234 11 6.1	1 35 41.5	2 3.5	1 14 45.7	5 16.6	9.8600447	9.9530179	9.9602197
18	240 33 32.7	1 35 31.9	1 31.3	0 53 15.2	5 28.0	9.8603593	9.9672799	9.9742031
22	246 55 22.3	1 35 23.0	−0 54.7	+0 31 7.1	−5 35.4	9.8606607	9.9809927	9.9876527
26	253 16 38.2	1 35 15.1	−0 15.4	+0 8 37.9	5 38.6	9.8609451	9.9941856	0.0005934
30	259 37 24.4	1 35 8.2	+0 24.6	-0 13 56.0	5 37.7	9.8612093	0.0068788	0.0130433
Apr. 3	265 57 45.3	1 35 2.4	1 3.4	0 36 18.1	5 32.7	9.8614499	0.0190889	0.0250178
7	272 17 45.3	1 34 57.8	1 39.1	0 58 12.2	5 23.7	9.8616641	0.0308319	0.0365344
11	278 37 29.2	1 34 54.4	+2 9.9	−1 19 22.5	−5 10.8	9.8618494	0.0421278	0.0476154
15	284 57 1.7	1 34 52.1	2 34.3	1 39 33.8	4 54.2	9.8620036	0.0530001	0.0582841
19	291 16 27.1	1 34 50.9	2 51.3	1 58 31.8	4 34.2	9.8621249	0.0634703	0.0685609
23	297 35 50.1	1 34 50.8	2 59.9	2 16 2.7	4 10.8	9.8622118	0.0735570	0.0784606
27	303 55 14.5	1 34 51.6	2 59.8	2 31 54.2	3 44 4	9.8622633	0.0832722	0.0879922
May 1	310 14 44.1	1 34 53.4	+2 51.0	−2 45 54.7	−3 15.4	9.8622788	0.0926218	0.0971614
5	316 34 22.3	1 34 55.9	2 33.8	2 57 54.2	2 44.0	9.8622583	0.1016120	0.1059746
9	322 54 12.1	1 34 59.1	2 9.2	3 7 43.9	2 10 6	9.8622017	0.1102501	0.1144404
13	329 14 15.9	1 35 2.9	1 38.3	3 15 16.6	1 35.6	9.8621100	0.1185470	0.1225723
17	335 34 36.0	1 35 7.2	1 2.6	3 20 26.7	0 59.3	9.8619841	0.1265173	0.1303837
21	341 55 14.0	1 35 11.9	+0 23.8	−3 23 10.1	−0 22.7	9.8618257	0.1341722	0.1378840
25	348 16 11.6	1 35 16.9	−0 16.2	3 23 24.5	+0 15.1	9.8616365	0.1415194	0.1450787
29	354 37 29.8	1 35 22.2	0 55.4	3 21 9.3	0 52.4	9.8614188	0.1485621	0.1519692
June 2	0 59 9.5	1 35 27.7	1 31.9	3 16 25.8	1 29.2	9.8611751	0.1553003	0.1585653
6	7 21 11.7	1 35 33.4	2 4.0	3 9 16.8	2 5.0	9.8609084	0.1617348	0.1648407
10	13 43 37.1	1 35 39.3	−2 30.0	−2 59 47.4	+2 39.4	9.8606220	0.1678721	0.1708311
14	20 6 26.2	1 35 45.3	2 48.7	2 48 3.8	3 12.0	9.8603191	0.1737185	0.1765351
18	26 29 39.7	1 35 51.5	2 59.0	2 34 14.3	3 42.3	9.8600037	0.1792826	0.1819611
22	32 53 18.2	1 35 57.8	3 0.4	2 18 28.6	4 10.0	9.8596794	0.1845715	0.1871139
26	39 17 22.5	1 36 4.3	2 52.9	2 0 58.0	4 34.7	9.8593504	0.1895882	0.1919941
30	45 41 53.2	1 36 11.0	−2 36.8	−1 41 55.3	+4 56.1	9.8590206	0.1943316	0.1966002
34	52 6 50.9	1 36 17.9	−2 12.8	−1 21 34.3	+5 13.8	9.8586942	0.1988003	0.2009323

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 4	52 6 50.9	1 36 17.9	−2 12.8	−1 21 34.3	+5 13.8	9.8586942	0.1988003	0.2009323
8	58 32 16.3	1 36 24.9	1 42.1	1 0 10.1	5 27.6	9.8583754	0.2029962	0.2049926
12	64 58 10.1	1 36 32.0	1 6.3	0 37 58.6	5 37.4	9.8580681	0.2069230	0.2087878
16	71 24 32.4	1 36 39.2	−0 27.0	−0 15 16.6	5 42.9	9.8577764	0.2105883	0.2123253
20	77 51 23.6	1 36 46.4	+0 13.6	+0 7 38.7	5 44.0	9.8575038	0.2139993	0.2156112
24	84 18 43.5	1 36 53.5	0 53.6	0 30 29.9	+5 40.8	9.8572540	0.2171604	0.2186474
28	90 46 31.5	1 37 0 4	1 30.9	0 52 59.4	5 33.2	9.8570304	0.2200719	0.2214339
Aug. 1	97 14 46.5	1 37 7.0	2 3.6	1 14 49.7	5 21.2	9.8568358	0.2227332	0.2239696
5	103 43 27.0	1 37 13.2	2 30.1	1 35 43.7	5 5.1	9.8566727	0.2251437	0.2262557
9	110 12 30.9	1 37 18.7	2 49.0	1 55 25.3	4 45.0	9.8565433	0.2273064	0.2282966
13	116 41 55.5	1 37 23.4	+2 59.2	+2 13 38.7	+4 21.1	9.8564494	0.2292277	0.2301002
17	123 11 37.4	1 37 27.4	3 0.3	2 30 9.8	3 53.9	9.8563921	0.2309151	0.2316734
21	129 41 32.8	1 37 30.2	2 52.1	2 44 45.5	3 23.5	9.8563723	0.2323755	0.2330216
25	136 11 37.0	1 37 31.8	2 35.1	2 57 14.3	2 50.5	9.8563901	0.2336116	0.2341455
29	142 41 45.3	1 37 32.1	2 10.1	3 7 26.5	2 15.2	9.8564454	0.2346234	0.2350454
Sept. 2	149 11 52.3	1 37 31.1	+1 38.5	+3 15 14.0	+1 38.3	9.8565374	0.2354115	0.2357219
6	155 41 52.5	1 37 28.7	4 1.9	3 20 31.1	1 0.1	9.8566650	0.2359768	0.2361773
10	162 11 40.3	1 37 24.9	+0 22.1	3 23 13.7	+0 21.2	9.8568264	0.2363241	0.2364182
14	168 41 10.2	1 37 19.8	−0 18.8	3 23 20.2	−0 17.9	9.8570197	0.2364609	0.2364528
18	175 10 16.6	1 37 13.3	0 58.7	3 20 50.8	0 56.7	9.8572421	0.2363950	0.2362878
22	181 38 54.7	1 37 5.6	−1 35.5	+3 15 48.0	−1 34.6	9.8574908	0.2361313	0.2359260
26	188 7 0.0	1 36 56.9	2 7.4	3 8 16.2	2 11.1	9.8577625	0.2356717	0.2353682
30	194 34 28.7	1 36 47.3	2 32.9	2 58 21.7	2 45.8	9.8580538	0.2350155	0.2346131
Oct. 4	201 1 17.7	1 36 37.1	2 50.7	2 46 12.9	3 16.2	9.8583608	0.2341619	0.2336620
8	207 27 24.6	1 36 26.4	2 59.8	2 31 59.4	3 48.0	9.8586797	0.2331141	0.2325184
12	213 52 48.0	1 36 15.4	−2 59.9	+2 15 52.8	−4 14.9	9.8590064	0.2318761	0.2311884
16	220 17 27.4	1 36 4.4	2 51.0	1 58 5.6	4 38.2	9.8593367	0.2304568	0.2296801
20	226 41 23.2	1 35 53.6	2 33.6	1 38 51.8	4 58.1	9.8596666	0.2288597	0.2279956
24	233 4 36.7	1 35 43.2	2 8.6	1 18 26.0	5 14.2	9.8599918	0.2270880	0.2261360
28	239 27 9.8	1 35 33.4	1 37.3	0 57 3.8	5 26.3	9.8603083	0.2251398	0.2240986
Nov. 1	245 49 5.3	1 35 24.4	−1 1.3	+0 35 1.1	−5 34.4	9.8606123	0.2230126	0.2218815
5	252 10 26.6	1 35 16.4	−0 22.3	+0 12 34.4	5 38.3	9.8609000	0.2207050	0.2194836
9	258 31 17.5	1 35 9.3	+0 17.7	−0 9 59.9	5 38.1	9.8611680	0.2182182	0.2169087
13	264 51 42.2	1 35 3.2	0 56.8	0 32 25.2	5 33.8	9.8614129	0.2155562	0.2141611
17	271 11 45.1	1 34 58.4	1 33.1	0 54 25.3	5 25.6	9.8616320	0.2127235	0.2112433
21	277 31 31.3	1 34 54 8	+2 4.9	−1 15 44.4	−5 13.4	9.8618224	0.2097206	0.2081549
25	283 51 5.1	1 34 52.3	2 30.6	1 36 7.1	4 57.4	9.8619821	0.2065456	0.2048918
29	290 10 31.2	1 34 50.9	2 48.9	1 55 18.9	4 37.9	9.8621092	0.2031926	0.2014474
Dec. 3	296 29 54.0	1 34 50.6	2 59.0	2 13 6.0	4 15.1	9.8622019	0.1996559	0.1978171
7	302 49 17.6	1 34 51.3	3 0.4	2 29 15.6	3 49.2	9.8622593	0.1959311	0.1939979
11	309 8 45.8	1 34 52.9	+2 53.1	−2 43 36.3	−3 20.6	9.8622809	0.1920184	0.1899920
15	315 28 22.1	1 34 55.3	2 37.4	2 55 57.6	2 49.6	9.8622663	0.1879178	0.1857962
19	321 48 9.4	1 34 58.4	2 14.0	3 6 10.6	2 16.5	9.8622156	0.1836277	0.1814112
23	328 8 10.5	1 35 2.2	1 44.1	3 14 7.7	1 41.8	9.8621295	0.1791457	0.1768296
27	334 28 27.5	1 35 6.4	1 9.1	3 19 43.1	1 5.7	9.8620091	0.1744617	0.1720411
31	340 49 2.3	1 35 11.0	+0 30.7	−3 22 52.3	−0 28.8	9.8618557	0.1695659	0.1670349
35	347 9 56.3	1 35 16.0	−0 9.2	−3 23 32 8	+0 8 6	9.8616712	0.1644471	0.1618019

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 1	18 50 27.1	36 12.46	−46.6	−0 55 18.3	+60 82	0.1512632	0.2063358	0.2100823
5	21 14 53.3	36 0.80	44.1	0 51 12.7	61.90	0.1524145	0.2138057	0.2175046
9	23 38 32.1	35 48.75	41.4	0 47 3.1	62.84	0.1536082	0.2211779	0.2248252
13	26 1 22.8	35 36.55	38.4	0 42 50.0	63.65	0.1548413	0.2284448	0.2320369
17	28 23 24.1	35 24.12	35.1	0 38 33.9	64 32	0.1561115	0.2356015	0.2391375
21	30 44 35.3	35 11.37	−31.7	−0 34 15.4	+64.85	0.1574158	0.2426461	0.2461273
25	33 4 54.8	34 58.38	28.0	0 29 55.1	65.25	0.1587516	0.2495813	0.2530087
29	35 24 21.9	34 45.18	24.1	0 25 33.4	65.54	0.1601161	0.2564093	0.2597832
Feb. 2	37 42 55.9	34 31.84	20.1	0 21 10.8	65.69	0.1615067	0.2631301	0.2664489
6	40 0 36.4	34 18.38	16.1	0 16 47.9	65.70	0.1629202	0.2697391	0.2730004
10	42 17 22.6	34 4.78	−12.0	−0 12 25.2	+65.62	0.1643545	0.2762307	0.2794303
14	44 33 14.4	33 51.14	7.8	0 8 2.9	65.44	0.1658068	0.2825990	0.2857359
18	46 48 11.6	33 37.44	− 3.6	−0 3 41.7	65.13	0.1672744	0.2888415	0.2919161
22	49 2 13.9	33 23.74	+ 0.6	+0 0 38.1	64.71	0.1687550	0.2949599	0.2979732
26	51 15 21.5	33 10.05	4.8	0 4 56.0	64.20	0.1702456	0.3009560	0.3039087
Mar. 2	53 27 34.3	32 56.39	+ 8.9	+0 9 11.7	+63.61	0.1717443	0.3068309	0.3097217
6	55 38 52.6	32 42.77	12.9	0 13 24.9	62.94	0.1732485	0.3125814	0.3154084
10	57 49 16.5	32 29.17	16.7	0 17 35.2	62.16	0.1747557	0.3182024	0.3209626
14	59 58 46.1	32 15.69	20.6	0 21 42.2	61.31	0.1762641	0.3236889	0.3263808
18	62 7 22.1	32 2.35	24.3	0 25 45.7	60 39	0.1777710	0.3290384	0.3316619
22	64 15 5.0	31 49.11	+27.8	+0 29 45.3	+59.40	0.1792744	0.3342517	0.3368079
26	66 21 55.2	31 36.04	31.2	0 33 40.9	58 35	0.1807722	0.3393311	0.3418215
30	68 27 53.5	31 23.14	34.3	0 37 32.1	57.24	0.1822627	0.3442786	0.3467024
Apr. 3	70 33 0.5	31 10.37	37.2	0 41 18.8	56.07	0.1837439	0.3490925	0.3514482
7	72 37 16.7	30 57.76	39.9	0 45 0.7	54.85	0.1852139	0.3537686	0.3560537
11	74 40 42.9	30 45.39	+42.5	+0 48 37.6	+53.57	0.1866711	0.3583027	0.3605155
15	76 43 20.1	30 33.94	44.7	0 52 9.3	52.26	0.1881134	0.3626918	0.3648322
19	78 45 9.1	30 21.34	46.7	0 55 35.7	50.91	0.1895396	0.3669369	0.3690062
23	80 46 11.1	30 9.64	48.5	0 58 56.6	49.52	0.1909475	0.3710401	0.3730395
27	82 46 26.5	29 58.16	50.0	1 2 11.9	48.11	0.1923365	0.3750039	0.3769337
May 1	84 45 56.7	29 46.91	+51.2	+1 5 21.5	+46.65	0.1937047	0.3788279	0.3806868
5	86 44 42.2	29 35.94	52.3	1 8 25.1	45.16	0.1950509	0.3825091	0.3842947
9	88 42 44.6	29 25.24	53.1	1 11 22.8	43 66	0.1963736	0.3860429	0.3877537
13	90 40 4.5	29 14.77	53.6	1 14 14.4	42.14	0.1976716	0.3894269	0.3910625
17	92 36 43.2	29 4.59	53.9	1 16 59.9	40.59	0.1989438	0.3926607	0.3942225
21	94 32 41.6	28 54.65	+53.9	+1 19 39.1	+39.01	0.2001891	0.3957476	0.3972365
25	96 28 0.8	28 45.02	53.7	1 22 12.0	37.44	0.2014065	0.3986892	0.4001059
29	98 22 42.2	28 35.66	53.2	1 24 38.6	35.86	0.2025950	0.4014861	0.4028296
June 2	100 16 46.5	28 26.59	52.5	1 26 58.9	34.25	0.2037534	0.4041356	0.4054037
6	102 10 15.3	28 17.81	51.5	1 29 12.6	32.63	0.2048813	0.4066339	0.4078251
10	104 3 9.4	28 9.32	+50.4	+1 31 19.9	+31.01	0.2059776	0.4089777	0.4100914
14	105 55 30.3	28 1.11	49.0	1 33 20.7	29.39	0.2070413	0.4111665	0.4122032
18	107 47 18.7	27 53.18	47.5	1 35 15.0	27.76	0.2080719	0.4132022	0.4141631
22	109 38 36.1	27 45.59	45.8	1 37 2.8	26.12	0.2090683	0.4150866	0.4159727
26	111 29 23.8	27 38.30	43.8	1 38 44.0	24.49	0.2100305	0.4168210	0.4176314
30	113 19 42.9	27 31.30	+41.7	+1 40 18.7	+22.85	0.2109575	0.4184030	0.4191354
July 4	115 9 34.6	27 24 57	+39.4	+1 41 46.8	+21.21	0.2118489	0.4198285	0.4204812

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 4	115 9 34.6	27 24.57	+39.4	+1 41 46.8	+21.21	0.2118489	0.4198285	0.4204812
8	116 58 59.9	27 18.14	37.0	1 43 8.4	19.57	0.2127038	0.4210937	0.4216658
12	118 48 0.1	27 12.00	34.5	1 44 23.4	17.94	0.2135218	0.4221976	0.4226891
16	120 36 36.3	27 6.17	31.9	1 45 31.9	16.31	0.2143027	0.4231407	0.4235529
20	122 24 49.9	27 0.66	29.1	1 46 33.9	14.69	0.2150458	0.4239255	0.4242587
24	124 12 42.0	26 55.45	+26.1	+1 47 29.4	+13.05	0.2157507	0.4245523	0.4248060
28	126 0 13.9	26 50.54	23.1	1 48 18.3	11.43	0.2164169	0.4250192	0.4251918
Aug. 1	127 47 26.7	26 45.91	20.0	1 49 0.8	9.82	0.2170444	0.4253225	0.4254107
5	129 34 21.6	26 41.56	16.8	1 49 36.9	8.21	0.2176326	0.4254570	0.4254602
9	131 20 59.6	26 37.50	13.6	1 50 6.5	6.60	0.2181812	0.4254212	0.4253391
13	133 7 22.0	26 33.79	+10.4	+1 50 29.7	+ 5.00	0.2186903	0.4252148	0.4250481
17	134 53 30.3	26 30.37	7.2	1 50 46.5	3.42	0.2191591	0.4248394	0.4245886
21	136 39 25.4	26 27.24	3.9	1 50 57.1	1.85	0.2195876	0.4242959	0.4239602
25	138 25 8.6	26 24.30	+ 0.6	1 51 1.3	+ 0.27	0.2199756	0.4235818	0.4231595
29	140 10 40.9	26 21.85	− 2.7	1 50 59.3	− 1.30	0.2203227	0.4226932	0.4221819
Sept. 2	141 56 3.8	26 19.61	− 6.0	+1 50 50.9	− 2.87	0.2206292	0.4216250	0.4210228
6	143 41 18.2	26 17.68	9.3	1 50 36.3	4.41	0.2208946	0.4203747	0.4196804
10	145 26 25.6	26 16.08	12.5	1 50 15.6	5.94	0.2211190	0.4189404	0.4181545
14	147 11 27.1	26 14.73	15.7	1 49 48.8	7.49	0.2213020	0.4173236	0.4164470
18	148 56 23.8	26 13.69	18.8	1 49 15.7	9.02	0.2214438	0.4155251	0.4145570
22	150 41 17.0	26 12.96	−21.8	+1 48 36.6	−10.54	0.2215443	0.4135426	0.4124814
26	152 26 7.8	26 12.50	24.8	1 47 51.4	12.04	0.2216033	0.4113722	0.4102150
30	154 10 57.4	26 12.34	27.7	1 47 0.3	13.53	0.2216211	0.4090087	0.4077527
Oct. 4	155 55 46.9	26 12.47	30.5	1 46 3.2	15.02	0.2215972	0.4064471	0.4050915
8	157 40 37.6	26 12.91	33.1	1 45 0.1	16.49	0.2215318	0.4036864	0.4022312
12	159 25 30.6	26 13.66	−35.6	+1 43 51.3	−17.95	0.2214252	0.4007268	0 3991729
16	161 10 27.3	26 14.70	38.0	1 42 36.5	19.42	0.2212769	0.3975693	0.3959159
20	162 55 28.6	26 16.05	40.2	1 41 15.9	20.86	0.2210876	0.3942122	0.3924576
24	164 40 36.1	26 17.71	42.4	1 39 49.6	22.29	0.2208570	0 3906512	0.3887926
28	166 25 50.7	26 19.63	44.4	1 38 17.6	23.71	0.2205852	0.3868808	0.3849153
Nov. 1	168 11 13.5	26 21.85	−46.2	+1 36 39.9	−25.12	0.2202726	0.3828957	0.3808219
5	169 56 45.9	26 24.40	47.8	1 34 56.6	26.51	0.2199191	0.3786937	0.3765117
9	171 42 29.1	26 27.25	49.2	1 33 7.8	27.90	0.2195249	0.3742755	0.3719854
13	173 28 24.3	26 30.38	50.5	1 31 13.4	29.27	0.2190903	0.3696416	0.3672436
17	175 14 32.4	26 33.79	51.5	1 29 13.6	30.62	0.2186156	0.3647911	0.3622834
•21	177 0 55.0	26 37.58	−52.4	+1 27 8.4	−31.96	0.2181007	0.3597198	0.3570999
25	178 47 33.0	26 41.58	53.1	1 24 57.9	33.28	0.2175461	0.3544222	0.3516864
29	180 34 27.6	26 45.87	53.6	1 22 42.2	34.59	0.2169520	0.3488923	0.3460393
Dec. 3	182 21 40.4	26 50.54	53.9	1 20 21.2	35.89	0.2163185	0.3431275	0.3401573
7	184 9 12.3	26 55.46	53.9	1 17 55.1	37.16	0.2156464	0.3371284	0.3340413
11	185 57 4.5	27 0.72	−53.8	+1 15 23.9	−38.41	0.2149359	0.3308959	0.3276924
15	187 45 18.5	27 6.29	53.4	1 12 47.8	39.65	0.2141872	0.3244302	0.3211088
19	189 33 55.2	27 12.11	52.9	1 10 6.7	40.87	0.2134007	0.3177272	0.3142848
23	191 22 55.8	27 18.26	52.0	1 7 20.8	42.06	0.2125771	0.3107811	0.3072151
27	193 12 21.7	27 24.73	50.9	1 4 30.2	43.22	0.2117168	0.3035663	0.2998943
31	195 2 14.0	27 31.47	−49.7	+1 1 35.0	−44.37	0.2108204	0.2961390	0.2923205
35	196 52 33.9	27 38.57	−48.3	+0 58 35.2	−45.51	0.2098880		

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 1	320 50 16.6	5 18.80	+26.9	−0 52 7.8	−5.45	0.7022067	0.7652953	0.7665476
5	321 11 32.0	5 18.95	26.9	0 52 29.5	5.43	0.7021072	0.7677419	0.7688778
9	321 32 48.1	5 19.09	27.0	0 52 51.1	5.40	0.7020081	0.7699547	0.7709722
13	321 54 4.8	5 19.24	27.0	0 53 12.7	5.37	0.7019095	0.7719301	0.7728279
17	322 15 22.0	5 19.39	27.1	0 53 34.1	5.34	0.7018113	0.7736656	0.7744431
21	322 36 40.0	5 19.53	+27.1	−0 53 55.4	−5.31	0.7017135	0.7751606	0.7758182
25	322 57 58.3	5 19.67	27.1	0 54 16.6	5.28	0.7016163	0.7764158	0.7769536
29	323 19 17.3	5 19.82	27.1	0 54 37.6	5.25	0.7015195	0.7774312	0.7778486
Feb. 2	323 40 36.8	5 19.96	27.2	0 54 58.5	5.22	0.7014232	0.7782055	0.7785018
6	324 1 56.9	5 20.10	27.2	0 55 19.4	5.19	0.7013274	0.7787373	0.7789118
10	324 23 17.6	5 20.24	+27.2	−0 55 40.1	−5.16	0.7012321	0.7790254	0.7790779
14	324 44 38.9	5 20.38	27.1	0 56 0.7	5.13	0.7011374	0.7790696	0.7790008
18	325 6 0.7	5 20.53	27.1	0 56 21.1	5.10	0.7010431	0.7788717	0.7786824
22	325 27 23.1	5 20.67	27.1	0 56 41.5	5.07	0.7009493	0.7784332	0.7781245
26	325 48 46.0	5 20.81	27.1	0 57 1.7	5.04	0.7008560	0.7777564	0.7773289
Mar. 2	326 10 9.5	5 20.95	+27.1	−0 57 21.8	−5.01	0.7007633	0.7768419	0.7762954
6	326 31 33.6	5 21.08	27.0	0 57 41.8	4.98	0.7006711	0.7756895	0.7750243
10	326 52 58.2	5 21.22	27.0	0 58 1.6	4.95	0.7005794	0.7743000	0.7735165
14	327 14 23.3	5 21.35	27.0	0 58 21.4	4.92	0.7004883	0.7726743	0.7717740
18	327 35 49.0	5 21.48	26.9	0 58 41.0	4.88	0.7003978	0.7708160	0.7698008
22	327 57 15.2	5 21.62	+26.9	−0 59 0.4	−4.85	0.7003078	0.7687288	0.7676002
26	328 18 41.9	5 21.75	26.9	0 59 19.8	4.82	0.7002183	0.7664155	0.7651751
30	328 40 9.2	5 21.89	26.8	0 59 39.0	4.79	0.7001294	0.7638790	0.7625275
Apr. 3	329 1 37.0	5 22.02	26.8	0 59 58.0	4.75	0.7000410	0.7611208	0.7596591
7	329 23 5.4	5 22.15	26.7	1 0 17.0	4.72	0.6999532	0.7581429	0.7565726
11	329 44 34.3	5 22.28	+26.7	−1 0 35.8	−4.68	0.6998659	0.7549489	0.7532726
15	330 6 3.7	5 22.41	26.6	1 0 54.5	4.65	0.6997793	0.7515444	0.7497651
19	330 27 33.6	5 22.54	26.5	1 1 13.0	4.62	0.6996932	0.7479355	0.7460562
23	330 49 4.0	5 22.66	26.4	1 1 31.4	4.58	0.6996077	0.7441279	0.7421512
27	331 10 34.9	5 22.79	26.3	1 1 49.7	4.55	0.6995228	0.7401268	0.7380552
May 1	331 32 6.3	5 22.92	+26.3	−1 2 7.8	−4.51	0.6994385	0.7359372	0.7337733
5	331 53 38.2	5 23.04	26.2	1 2 25.8	4.48	0.6993548	0.7315645	0.7293119
9	332 15 10.7	5 23.17	26.1	1 2 43.6	4.44	0.6992717	0.7270165	0.7246793
13	332 36 43.6	5 23.30	26.0	1 3 1.3	4.41	0.6991891	0.7223020	0.7198863
17	332 58 17.1	5 23.43	25.9	1 3 18.9	4.37	0.6991072	0.7174335	0.7149449
21	333 19 51.0	5 23.55	+25.8	−1 3 36.3	−4.34	0.6990260	0.7124219	0.7098656
25	333 41 25.5	5 23.67	25.7	1 3 53.6	4.30	0.6989453	0.7072775	0.7046591
29	334 3 0.4	5 23.79	25.6	1 4 10.7	4.26	0.6988653	0.7020119	0.6993373
June 2	334 24 35.7	5 23.91	25.5	1 4 27.7	4.23	0.6987860	0.6966375	0.6939146
6	334 46 11.6	5 24.02	25.3	1 4 44.6	4.19	0.6987072	0.6911708	0.6884078
10	335 7 47.9	5 24.14	+25.2	−1 5 1.2	−4.16	0.6986291	0.6856287	0.6828361
14	335 29 21.7	5 24.26	25.1	1 5 17.8	4.12	0.6985516	0.6800330	0.6772214
18	335 51 2.0	5 24.38	25.0	1 5 34.2	4.08	0.6984747	0.6744043	0.6715843
22	336 12 39.7	5 24.50	24.8	1 5 50.4	4.04	0.6983985	0.6687642	0.6659465
26	336 34 18.0	5 24.61	24.7	1 6 6.6	4.01	0.6983229	0.6631344	0.6603307
30	336 55 56.7	5 24.73	+24.5	−1 6 22.5	−3.97	0.6982479	0.6575393	0.6547637
July 4	337 17 35.8	5 24.84	+24.4	−1 6 38.3	−3.93	0.6981735	0.6520077	0.6492751

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 4	337 17 35.8	5 24.84	+24.4	−1 6 38.3	−3.93	0.6981735	0.6520077	0.6492751
8	337 39 15.4	5 24.95	24.2	1 6 53.9	3.89	0.6980998	0.6465701	0.6438970
12	338 0 55.4	5 25.05	24.1	1 7 9.4	3.85	0.6980267	0.6412601	0.6386635
16	338 22 35.8	5 25.16	23.9	1 7 24.8	3.81	0.6979543	0.6361112	0.6336073
20	338 44 16.7	5 25.27	23.8	1 7 40.0	3.77	0.6978826	0.6311558	0.6287609
24	339 5 58.0	5 25.38	+23.6	−1 7 54.9	−3.73	0.6978115	0.6264269	0.6241579
28	339 27 39.7	5 25.49	23.4	1 8 9.8	3.70	0.6977410	0.6219587	0.6198337
Aug. 1	339 49 21.9	5 25.60	23.2	1 8 24.5	3.66	0.6976712	0.6177877	0.6158256
5	340 11 4.5	5 25.70	23.1	1 8 39.1	3.62	0.6976021	0.6139518	0.6121708
9	340 32 47.5	5 25.80	22.9	1 8 53.5	3.58	0.6975337	0.6104866	0.6089035
13	340 54 30.9	5 25.90	+22.7	−1 9 7.7	−3.54	0.6974659	0.6074248	0.6060544
17	341 16 14.7	5 26.00	22.5	1 9 21.8	3.50	0.6973988	0.6047950	0.6036500
21	341 37 58.9	5 26.10	22.3	1 9 35.7	3.46	0.6973325	0.6026219	0.6017134
25	341 59 43.5	5 26.20	22.1	1 9 49.4	3.41	0.6972668	0.6009271	0.6002660
29	342 21 28.5	5 26.30	21.9	1 10 3.0	3.37	0.6972018	0.5997316	0.5993263
Sept. 2	342 43 13.9	5 26.40	+21.7	−1 10 16.4	−3.33	0.6971375	0.5990511	0.5989078
6	343 4 59.7	5 26.50	21.5	1 10 29.7	3.29	0.6970739	0.5988962	0.5990168
10	343 26 45.9	5 26.60	21.3	1 10 42.7	3.25	0.6970109	0.5992688	0.5996519
14	343 48 32.5	5 26.69	21.1	1 10 55.7	3.21	0.6969487	0.6001645	0.6008054
18	344 10 19.5	5 26.78	20.9	1 11 8.4	3.17	0.6968871	0.6015725	0.6024644
22	344 32 6.8	5 26.87	+20.7	−1 11 21.0	−3.12	0.6968263	0.6034784	0.6046128
26	344 53 54.5	5 26.96	20.4	1 11 33.4	3.08	0.6967662	0.6058647	0.6072314
30	345 15 42.5	5 27.05	20.2	1 11 45.7	3.04	0.6967068	0.6087098	0.6102975
Oct. 4	345 37 30.9	5 27.14	20.0	1 11 57.7	3.00	0.6966482	0.6119896	0.6137818
8	345 59 19.6	5 27.23	19.7	1 12 9.6	2.95	0.6965903	0.6156697	0.6176492
12	346 21 8.7	5 27.32	+19.5	−1 12 21.4	−2.91	0.6965331	0.6197153	0.6218634
16	346 42 58.2	5 27.41	19.3	1 12 32.9	2.87	0.6964767	0.6240889	0.6263873
20	347 4 46.0	5 27.49	19.0	1 12 44.3	2.83	0.6964210	0.6287541	0.6311849
24	347 26 38.1	5 27.58	18.8	1 12 55.6	2.78	0.6963660	0.6336754	0.6362212
28	347 48 28.6	5 27.66	18.5	1 13 6.6	2.74	0.6963119	0.6388178	0.6414607
Nov. 1	348 10 19.5	5 27.74	+18.3	−1 13 17.5	−2.70	0.6962586	0.6441452	0.6468667
5	348 32 10.6	5 27.82	18.0	1 13 28.2	2.65	0.6962060	0.6496205	0.6524019
9	348 54 2.0	5 27.90	17.8	1 13 38.7	2.61	0.6961542	0.6552068	0.6580306
13	349 15 53.8	5 27.98	17.5	1 13 49.0	2.56	0.6961031	0.6608698	0.6637202
17	349 37 45.9	5 28.05	17.2	1 13 59.2	2.52	0.6960528	0.6665788	0.6694422
21	349 59 38.2	5 28.13	+17.0	−1 14 9.2	−2.48	0.6960032	0.6723069	0.6751691
25	350 21 30.9	5 28.21	16.7	1 14 19.0	2.43	0.6959543	0.6780262	0.6808755
29	350 43 23.9	5 28.29	16.4	1 14 28.6	2.39	0.6959062	0.6837138	0.6865377
Dec. 3	351 5 17.2	5 28.36	16.1	1 14 38.1	2.34	0.6958589	0.6893444	0.6921307
7	351 27 10.8	5 28.43	15.9	1 14 47.4	2.30	0.6958121	0.6948943	0.6976323
11	351 49 4.7	5 28.50	+15.6	−1 14 56.5	−2.25	0.6957661	0.7003429	0.7030237
15	352 10 58.8	5 28.56	15.3	1 15 5.4	2.21	0.6957209	0.7056732	0.7082894
19	352 32 53.2	5 28.63	15.0	1 15 14.1	2.16	0.6956765	0.7108708	0.7134159
23	352 54 47.8	5 28.70	14.7	1 15 22.7	2.12	0.6956327	0.7159229	0.7183901
27	353 16 42.8	5 28.76	14.4	1 15 31.0	2.07	0.6955897	0.7208161	0.7231993
31	353 38 38.0	5 28.83	+14.1	−1 15 39.2	−2.02	0.6955475	0.7255382	0.7278311
35	354 0 33.4	5 28.89	+13.8	−1 15 47.2	−1.98	0.6955061		

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 1	161 38 2.2	2 5.50	+1 36.7	+1 52 41.2	+3.58	0.9703060	0.9494387	0.9479678
5	161 46 24.2	2 5.47	1 36.7	1 52 55.6	3.57	0.9703591	0.9465150	0.9450859
9	161 54 46.1	2 5.44	1 36.6	1 53 9.8	3.56	0.9704122	0.9436818	0.9423051
13	162 3 7.8	2 5.41	1 36.5	1 53 24.1	3.55	0.9704653	0.9409579	0.9396426
17	162 11 29.4	2 5.38	1 36.5	1 53 38.2	3.54	0.9705165	0.9383615	0.9371166
21	162 19 50.8	2 5.35	+1 36.4	+1 53 52.4	+3.53	0.9705717	0.9359100	0.9347436
25	162 28 12.3	2 5.32	1 36.3	1 54 6.5	3.52	0.9706249	0.9336195	0.9325393
29	162 36 33.5	2 5.29	1 36.2	1 54 20.5	3.51	0.9706781	0.9315051	0.9305186
Feb. 2	162 44 54.6	2 5.26	1 36.1	1 54 34.5	3.50	0.9707314	0.9295820	0.9286971
6	162 53 15.6	2 5.23	1 36.0	1 54 48.5	3.49	0.9707848	0.9278656	0.9270891
10	163 1 36.6	2 5.20	+1 35.9	+1 55 2.4	+3.47	0.9708381	0.9263692	0.9257077
14	163 9 57.3	2 5.17	1 35.9	1 55 16.4	3.46	0.9708915	0.9251054	0.9245637
18	163 18 17.9	2 5.14	1 35.8	1 55 30.2	3.45	0.9709450	0.9240832	0.9236648
22	163 26 38.4	2 5.11	1 35.7	1 55 44.0	3.44	0.9709985	0.9233093	0.9230174
26	163 34 58.9	2 5.08	1 35.6	1 55 57.7	3.43	0.9710519	0.9227895	0.9226258
Mar. 2	163 43 19.1	2 5.05	+1 35.5	+1 56 11.4	+3.42	0.9711055	0.9224266	0.9224926
6	163 51 39.3	2 5.02	1 35.4	1 56 25.1	3.41	0.9711590	0.9225235	0.9226198
10	163 59 59.3	2 4.99	1 35.3	1 56 38.7	3.40	0.9712126	0.9227809	0.9230068
14	164 8 19.2	2 4.96	1 35.2	1 56 52.2	3.39	0.9712663	0.9232965	0.9236500
18	164 16 39.0	2 4.93	1 35.0	1 57 5.8	3.37	0.9713200	0.9240658	0.9245428
22	164 24 58.7	2 4.90	+1 34.9	+1 57 19.2	+3.36	0.9713738	0.9250800	0.9256763
26	164 33 18.2	2 4.86	1 34.8	1 57 32.7	3.35	0.9714275	0.9263305	0.9270411
30	164 41 37.6	2 4.83	1 34.7	1 57 46.1	3.34	0.9714813	0.9278071	0.9286271
Apr. 3	164 49 56.8	2 4.80	1 34.6	1 57 59.5	3.33	0.9715352	0.9294996	0.9304232
7	164 58 16.0	2 4.77	1 34.5	1 58 12.8	3.32	0.9715890	0.9313961	0.9324163
11	165 6 35.0	2 4.74	+1 34.3	+1 58 26.0	+3.31	0.9716429	0.9334822	0.9345918
15	165 14 54.0	2 4.71	1 34.2	1 58 39.2	3.30	0.9716969	0.9357428	0.9369331
19	165 23 12.8	2 4.68	1 34.1	1 58 52.4	3.29	0.9717508	0.9381606	0.9394235
23	165 31 31.5	2 4.65	1 34.0	1 59 5.6	3.27	0.9718048	0.9407195	0.9420469
27	165 39 50.0	2 4.62	1 33.9	1 59 18.6	3.26	0.9718589	0.9434036	0.9447875
May 1	165 48 8.4	2 4.59	+1 33.7	+1 59 31.7	+3.25	0.9719129	0.9461968	0.9476297
5	165 56 26.8	2 4.56	1 33.6	1 59 44.6	3.24	0.9719671	0.9490839	0.9505575
9	166 4 45.0	2 4.53	1 33.5	1 59 57.6	3.23	0.9720212	0.9520483	0.9535543
13	166 13 3.0	2 4.50	1 33.3	2 0 10.5	3.22	0.9720753	0.9550733	0.9566031
17	166 21 21.0	2 4.47	1 33.2	2 0 23.3	3.21	0.9721295	0.9581420	0.9596879
21	166 29 38.8	2 4.43	+1 33.1	+2 0 36.1	+3.20	0.9721837	0.9612392	0.9627940
25	166 37 56.4	2 4.40	1 32.9	2 0 48.9	3.18	0.9722380	0.9643507	0.9659076
29	166 46 14.0	2 4.37	1 32.7	2 1 1.6	3.17	0.9722923	0.9674633	0.9690160
June 2	166 54 31.4	2 4.34	1 32.6	2 1 14.3	3.16	0.9723466	0.9705643	0.9721067
6	167 2 48.7	2 4.31	1 32.4	2 1 26.9	3.15	0.9724010	0.9736413	0.9751664
10	167 11 6.0	2 4.28	+1 32.3	+2 1 39.5	+3.14	0.9724554	0.9766806	0.9781827
14	167 19 23.0	2 4.25	1 32.1	2 1 52.0	3.13	0.9725098	0.9796711	0.9811441
18	167 27 40.0	2 4.22	1 32.0	2 2 4.5	3.12	0.9725642	0.9826010	0.9840403
22	167 35 56.8	2 4.19	1 31.8	2 2 17.0	3.10	0.9726186	0.9854611	0.9868624
26	167 44 13.5	2 4.16	1 31.6	2 2 29.4	3.09	0.9726731	0.9882433	0.9896026
30	167 52 30.1	2 4.13	+1 31.5	+2 2 41.7	+3.08	0.9727276	0.9909394	0.9922524
July 4	168 0 46.6	2 4.10	+1 31.3	+2 2 54.0	+3.07	0.9727822	0.9935408	0.9948033

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 4	168 0 46.6	2 4.10	+1 31.3	+2 2 54.0	+3.07	0.9727822	0.9935408	0.9948033
8	168 9 2.9	2 4.07	1 31.2	2 3 6.3	3.06	0.9728367	0.9960392	0.9972474
12	168 17 19.2	2 4.03	1 31.0	2 3 18.5	3.05	0.9728913	0.9984269	0.9995772
16	168 25 35.2	2 4.00	1 30.8	2 3 30.7	3.04	0.9729459	1.0006976	1.0017872
20	168 33 51.2	2 3.97	1 30.6	2 3 42.8	3.02	0.9730006	1.0028458	1.0038727
24	168 42 7.0	2 3.94	+1 30.5	+2 3 54.9	+3.01	0.9730552	1.0048673	1.0058288
28	168 50 22.7	2 3.91	1 30.3	2 4 6.9	3.00	0.9731099	1.0067570	1.0076512
Aug. 1	168 58 38.3	2 3.88	1 30.1	2 4 18.9	2.99	0.9731646	1.0085106	1.0093344
5	169 6 53.8	2 3.85	1 30.0	2 4 30.8	2.98	0.9732193	1.0101224	1.0108740
9	169 15 9.2	2 3.82	1 29.8	2 4 42.7	2.97	0.9732741	1.0115898	1.0122659
13	169 23 24.4	2 3.79	+1 29.6	+2 4 54.6	+2.96	0.9733289	1.0129055	1.0135073
17	169 31 39.5	2 3.76	1 29.4	2 5 6.4	2.94	0.9733837	1.0140708	1.0145958
21	169 39 54.5	2 3.73	1 29.2	2 5 18.1	2.93	0.9734385	1.0150823	1.0155300
25	169 48 9.3	2 3.70	1 29.0	2 5 29.8	2.92	0.9734934	1.0159387	1.0163076
29	169 56 24.0	2 3.66	1 28.8	2 5 41.5	2.91	0.9735483	1.0166367	1.0169256
Sept. 2	170 4 38.7	2 3.63	+1 28.6	+2 5 53.1	+2.90	0.9736032	1.0171742	1.0173821
6	170 12 53.2	2 3.60	1 28.4	2 6 4.7	2.89	0.9736581	1.0175490	1.0176751
10	170 21 7.6	2 3.57	1 28.2	2 6 16.2	2.87	0.9737131	1.0177602	1.0178042
14	170 29 21.8	2 3.54	1 28.0	2 6 27.7	2.86	0.9737680	1.0178072	1.0177696
18	170 37 35.9	2 3.51	1 27.8	2 6 39.1	2.85	0.9738229	1.0176910	1.0175716
22	170 45 49.9	2 3.48	+1 27.6	+2 6 50.5	+2.84	0.9738780	1.0174112	1.0172099
26	170 54 3.8	2 3.45	1 27.4	2 7 1.8	2.83	0.9739330	1.0169678	1.0166845
30	171 2 17.5	2 3.42	1 27.2	2 7 13.1	2.82	0.9739880	1.0163602	1.0159949
Oct. 4	171 10 31.2	2 3.39	1 27.0	2 7 24.3	2.80	0.9740430	1.0155887	1.0151421
8	171 18 44.7	2 3.36	1 26.8	2 7 35.5	2.79	0.9740981	1.0146553	1.0141281
12	171 26 58.1	2 3.33	+1 26.6	+2 7 46.7	+2.78	0.9741532	1.0135614	1.0129555
16	171 35 11.3	2 3.30	1 26.4	2 7 57.8	2.77	0.9742084	1.0123107	1.0116274
20	171 43 24.4	2 3.26	1 26.1	2 8 8.9	2.76	0.9742634	1.0109057	1.0101461
24	171 51 37.4	2 3.23	1 25.9	2 8 19.9	2.75	0.9743186	1.0093489	1.0085143
28	171 59 50.4	2 3.20	1 25.7	2 8 30.9	2.73	0.9743738	1.0076428	1.0067349
Nov. 1	172 8 3.2	2 3.17	+1 25.5	+2 8 41.8	+2.72	0.9744289	1.0057911	1.0048120
5	172 16 15.8	2 3.14	1 25.2	2 8 52.7	2.71	0.9744841	1.0037985	1.0027512
9	172 24 28.3	2 3.11	1 25.0	2 9 3.5	2.70	0.9745393	1.0016712	1.0005591
13	172 32 40.7	2 3.08	1 24.8	2 9 14.3	2.69	0.9745945	0.9994157	0.9982420
17	172 40 52.9	2 3.05	1 24.5	2 9 25.1	2.68	0.9746498	0.9970387	0.9958066
21	172 49 5.1	2 3.02	+1 24.3	+2 9 35.7	+2.66	0.9747051	0.9945468	0.9932598
25	172 57 17.2	2 2.99	1 24.1	2 9 46.4	2.65	0.9747604	0.9919469	0.9906069
29	173 5 29.1	2 2.96	1 23.8	2 9 57.0	2.64	0.9748156	0.9892472	0.9878629
Dec. 3	173 13 40.8	2 2.93	1 23.6	2 10 7.5	2.63	0.9748709	0.9864573	0.9850323
7	173 21 52.5	2 2.89	1 23.3	2 10 18.0	2.62	0.9749262	0.9835889	0.9821288
11	173 30 4.0	2 2.86	+1 23.1	+2 10 28.4	+2.61	0.9749815	0.9806534	0.9791642
15	173 38 15.4	2 2.83	1 22.8	2 10 38.8	2.59	0.9750368	0.9776627	0.9761503
19	173 46 26.7	2 2.80	1 22.6	2 10 49.2	2.58	0.9750921	0.9746280	0.9730990
23	173 54 37.8	2 2.77	1 22.4	2 10 59.5	2.57	0.9751475	0.9715636	0.9700238
27	174 2 48.8	2 2.74	1 22.1	2 11 9.8	2.56	0.9752029	0.9684816	0.9669386
31	174 10 59.7	2 2.71	+1 21.9	+2 11 20.0	+2.55	0.9752582	0.9653974	0.9638599
35	174 19 10.5	2 2.68	+1 21.6	+2 11 30.1	+2.54	0.9753136		

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	208 0 45.7	45.67	−9.4	+0 33 4.4	−0.43	1.2664400	1.2737543	1.2722436
9	208 6 51.0	45.66	9.4	0 33 0.9	0.43	1.2664612	1.2706968	1.2691213
17	208 12 56.3	45.66	9.4	0 32 57.5	0.43	1.2664825	1.2675247	1.2659147
25	208 19 1.5	45.65	9.4	0 32 54.0	0 43	1.2665039	1.2642930	1.2626850
Feb. 2	208 25 6.7	45.64	9.4	0 32 50.5	0.43	1.2665253	1.2610803	1.2594929
10	208 31 11.8	45.64	−9.4	+0 32 47.0	−0.44	1.2665468	1.2579315	1.2564048
18	208 37 16.9	45.63	9.4	0 32 43.5	0.44	1.2665683	1.2549213	1.2534886
26	208 43 22.0	45.63	9.4	0 32 40.0	0.44	1.2665899	1.2521140	1.2508047
Mar. 6	208 49 27.0	45.62	9.4	0 32 36.5	0.44	1.2666115	1.2495683	1.2484122
14	208 55 32.0	45.62	9.4	0 32 33.0	0.44	1.2666332	1.2473433	1.2463680
22	209 1 36.9	45.61	−9.4	+0 32 29.5	−0.44	1.2666549	1.2454915	1.2447183
30	209 7 41.8	45.61	9.4	0 32 26.0	0.44	1.2666767	1.2440524	1.2434980
Apr. 7	209 13 46.6	45.60	9.4	0 32 22.5	0.44	1.2666985	1.2430585	1.2427367
15	209 19 51.4	45.60	9.4	0 32 19.0	0.44	1.2667204	1.2425344	1.2424522
23	209 25 56.1	45.59	9.4	0 32 15.4	0.44	1.2667424	1.2424895	1.2426455
May 1	209 32 0.8	45.59	−9.4	+0 32 11.9	−0.44	1.2667644	1.2429192	1.2433093
9	209 38 5.5	45.58	9.4	0 32 8.4	0.44	1.2667864	1.2438134	1.2444282
17	209 44 10.1	45.58	9.4	0 32 4.8	0.44	1.2668085	1.2451495	1.2459721
25	209 50 14.7	45.57	9.4	0 32 1.3	0.44	1.2668307	1.2468909	1.2479008
June 2	209 56 19.2	45.56	9.4	0 31 57.7	0.45	1.2668529	1.2489966	1.2501721
10	210 2 23.7	45.56	−9.4	+0 31 54.1	−0.45	1.2668751	1.2514211	1.2527359
18	210 8 28.2	45.55	9.4	0 31 50.6	0.45	1.2668974	1.2541093	1.2555340
26	210 14 32.6	45.55	9.4	0 31 47.0	0.45	1.2669198	1.2570032	1.2585099
July 4	210 20 36.9	45.54	9.3	0 31 43.4	0.45	1.2669422	1.2600472	1.2616076
12	210 26 41.2	45.54	9.3	0 31 39.8	0.45	1.2669647	1.2631833	1.2647664
20	210 32 45.5	45.53	−9.3	+0 31 36.2	−0.45	1.2669872	1.2663505	1.2679285
28	210 38 49.7	45.52	9.3	0 31 32.6	0.45	1.2670097	1.2694944	1.2710417
Aug. 5	210 44 53.9	45.52	9.3	0 31 29.0	0.45	1.2670323	1.2725632	1.2740535
13	210 50 58.0	45.51	9.3	0 31 25.4	0.45	1.2670550	1.2755055	1.2769134
21	210 57 2.1	45.51	9.3	0 31 21.8	0.45	1.2670777	1.2782726	1.2795782
29	211 3 6.2	45.50	−9.3	+0 31 18.2	−0.45	1.2671005	1.2808254	1.2820089
Sept. 6	211 9 10.2	45.50	9.3	0 31 14.5	0.45	1.2671233	1.2831244	1.2841671
14	211 15 14.2	45.49	9.3	0 31 10.9	0.45	1.2671462	1.2851333	1.2860200
22	211 21 18.1	45.49	9.3	0 31 7.3	0.45	1.2671691	1.2868245	1.2875437
30	211 27 22.0	45.48	9.3	0 31 3.6	0.46	1.2671921	1.2881745	1.2887142
Oct. 8	211 33 25.8	45.48	−9.3	+0 31 0.0	−0.46	1.2672151	1.2891602	1.2895113
16	211 39 29.6	45.47	9.3	0 30 56.3	0.46	1.2672382	1.2897664	1.2899245
24	211 45 33.3	45.47	9.3	0 30 52.7	0.46	1.2672613	1.2899849	1.2899469
Nov. 1	211 51 37.0	45.46	9.3	0 30 49.0	0.46	1.2672845	1.2898098	1.2895735
9	211 57 40.7	45.45	9.3	0 30 45.3	0.46	1.2673078	1.2892390	1.2888075
17	212 3 44.3	45.45	−9.3	+0 30 41.7	−0.46	1.2673311	1.2882807	1.2876598
25	212 9 47.9	45.44	9.3	0 30 38.0	0.46	1.2673544	1.2869469	1.2861436
Dec. 3	212 15 51.4	45.44	9.3	0 30 34.3	0.46	1.2673779	1.2852526	1.2842774
11	212 21 54.9	45.43	9.3	0 30 30.6	0.46	1.2674013	1.2832220	1.2820907
19	212 27 58.3	45.43	9.3	0 30 26.9	0.46	1.2674248	1.2808874	1.2796166
27	212 34 1.7	45.42	−9.3	+0 30 23.2	−0.46	1.2674484	1.2782831	1.2768918
35	212 40 5.1	45.42	−9.3	+0 30 19.5	−0.46	1.2674720		

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	65 36 49.3	22.01	−38.1	−1 36 46.7	+0.29	1.4746703	1.4629056	1.4635522
9	65 39 45.3	22.01	38.2	1 36 44.4	0.29	1.4746720	1.4642538	1.4650072
17	65 42 41.4	22.01	38.3	1 36 42.1	0.29	1.4746738	1.4658075	1.4666501
25	65 45 37.5	22.01	38.3	1 36 39.7	0.29	1.4746755	1.4675303	1.4684435
Feb. 2	65 48 33.6	22.01	38.4	1 36 37.4	0.29	1.4746773	1.4693849	1.4703500
10	65 51 29.7	22.01	−38.4	−1 36 35.1	+0.29	1.4746791	1.4713333	1.4723297
18	65 54 25.8	22.01	38.5	1 36 32.7	0.29	1.4746808	1.4733340	1.4743409
26	65 57 21.9	22.01	38.5	1 36 30.4	0.29	1.4746826	1.4753461	1.4763449
Mar. 6	66 0 18.0	22.01	38.6	1 36 28.0	0.29	1.4746844	1.4773326	1.4783046
14	66 3 14.1	22.01	38.6	1 36 25.7	0.29	1.4746862	1.4792563	1.4801830
22	66 6 10.2	22.01	−38.7	−1 36 23.3	+0.29	1.4746880	1.4810813	1.4819472
30	66 9 6.3	22.01	38.7	1 36 21.0	0.29	1.4746898	1.4827777	1.4835693
Apr. 7	66 12 2.4	22.01	38.8	1 36 18.6	0.30	1.4746916	1.4843190	1.4850231
15	66 14 58.5	22.01	38.8	1 36 16.2	0.30	1.4746934	1.4856794	1.4862849
23	66 17 54.7	22.02	38.9	1 36 13.9	0.30	1.4746952	1.4868380	1.4873369
May 1	66 20 50.8	22.02	−38.9	−1 36 11.5	+0.30	1.4746970	1.4877800	1.4881654
9	66 23 46.9	22.02	39.0	1 36 9.1	0.30	1.4746988	1.4884919	1.4887578
17	66 26 43.0	22.02	39.0	1 36 6.7	0.30	1.4747006	1.4889629	1.4891066
25	66 29 39.2	22.02	39.1	1 36 4.3	0.30	1.4747024	1.4891888	1.4892091
June 2	66 32 35.3	22.02	39.2	1 36 1.9	0.30	1.4747042	1.4891677	1.4890644
10	66 35 31.4	22.02	−39.2	−1 35 59.5	+0.30	1.4747060	1.4888999	1.4886745
18	66 38 27.6	22.02	39.3	1 35 57.1	0.30	1.4747078	1.4883897	1.4880407
26	66 41 23.7	22.02	39.3	1 35 54.7	0.30	1.4747096	1.4876468	1.4871911
July 4	66 44 19.9	22.02	39.4	1 35 52.3	0.30	1.4747115	1.4866812	1.4861191
12	66 47 16.0	22.02	39.4	1 35 49.9	0.30	1.4747133	1.4855068	1.4848470
20	66 50 12.2	22.02	−39.5	−1 35 47.5	+0.30	1.4747151	1.4841422	1.4833949
28	66 53 8.3	22.02	39.5	1 35 45.1	0.30	1.4747169	1.4826082	1.4817848
Aug. 5	66 56 4.5	22.02	39.6	1 35 42.6	0.30	1.4747188	1.4809281	1.4800411
13	66 59 0.6	22.02	39.6	1 35 40.2	0.30	1.4747206	1.4791279	1.4781926
21	67 1 56.8	22.02	39.7	1 35 37.8	0.30	1.4747225	1.4772389	1.4762706
29	67 4 53.0	22.02	−39.7	−1 35 35.3	+0.31	1.4747243	1.4752920	1.4743069
Sept. 6	67 7 49.1	22.02	39.8	1 35 32.9	0.31	1.4747261	1.4733204	1.4723373
14	67 10 45.3	22.02	39.8	1 35 30.4	0.31	1.4747280	1.4713621	1.4703996
22	67 13 41.5	22.02	39.9	1 35 28.0	0.31	1.4747298	1.4694541	1.4685299
30	67 16 37.7	22.02	39.9	1 35 25.5	0.31	1.4747316	1.4676320	1.4667655
Oct. 8	67 19 33.8	22.02	−40.0	−1 35 23.1	+0.31	1.4747335	1.4659349	1.4651452
16	67 22 30.0	22.02	40.0	1 35 20.6	0.31	1.4747353	1.4644001	1.4637036
24	67 25 26.2	22.02	40.1	1 35 18.1	0.31	1.4747372	1.4630595	1.4624720
Nov. 1	67 28 22.4	22.02	40.1	1 35 15.7	0.31	1.4747390	1.4619443	1.4614805
9	67 31 18.6	22.02	40.2	1 35 13.2	0.31	1.4747409	1.4610827	1.4607537
17	67 34 14.8	22.02	−40.2	−1 35 10.7	+0.31	1.4747427	1.4604950	1.4603084
25	67 37 11.0	22.02	40.3	1 35 8.2	0.31	1.4747446	1.4601951	1.4601567
Dec. 3	67 40 7.2	22.02	40.3	1 35 5.7	0.31	1.4747464	1.4601934	1.4603049
11	67 43 3.4	22.03	40.4	1 35 3.2	0.31	1.4747483	1.4604907	1.4607497
19	67 45 59.6	22.03	40.4	1 35 0.7	0.31	1.4747502	1.4610800	1.4614801
27	67 48 55.8	22.03	−40.5	−1 34 58.2	+0.31	1.4747520	1.4619481	1.4624815
35	67 51 52.0	22.03	−40.5	−1 34 55.7	+0.31	1.4747539	1.4630769	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 1	+0.1849500	+0.1935332	+743	−0.8858859	−0.8843442	+ 89	−0.3843464	−0.3836776	+153
2	0.2021013	0.2106542	732	0.8827332	0.8810537	99	0 3829789	0.3822505	158
3	0.2191913	0.2277116	721	0.8793053	0.8774885	109	0.3814922	0.3807043	163
4	0.2362146	0.2446996	709	0.8756032	0.8736497	119	0.3798865	0.3790393	167
5	0.2531658	0.2616128	698	0.8716280	0.8695383	128	0.3781623	0.3772560	172
6	+0.2700396	+0.2784456	+686	−0.8673806	−0.8651551	+137	−0.3763202	−0.3753551	+176
7	0.2868301	0.2951924	674	0.8628620	0.8605012	146	0.3743606	0.3733369	180
8	0.3035318	0.3118477	662	0.8580731	0.8555778	154	0.3722838	0.3712017	184
9	0.3201392	0.3284059	650	0.8530154	0.8503865	162	0.3700903	0.3689501	188
10	0.3366469	0.3448616	638	0.8476908	0.8449291	170	0.3677808	0.3665829	191
11	+0.3530493	+0.3612092	+626	−0.8421012	−0.8392078	+178	−0.3653562	−0.3641011	+195
12	0.3693408	0.3774431	613	0.8362487	0.8332246	185	0.3628175	0.3615056	198
13	0.3855158	0.3935581	601	0.8301352	0.8269814	192	0.3601654	0.3587971	201
14	0.4015694	0.4095492	589	0.8237629	0.8204804	198	0.3574008	0.3559766	204
15	0.4174967	0.4254115	577	0.8171340	0.8137241	205	0.3545247	0.3530452	207
16	+0.4332928	+0.4411402	+565	−0.8102510	−0.8067150	+211	−0.3515383	−0.3500041	+209
17	0.4489529	0.4567304	553	0.8031163	0.7994555	217	0.3484426	0.3468542	212
18	0.4644720	0.4721772	541	0.7957326	0.7919483	222	0.3452387	0.3435966	214
19	0.4798453	0.4874759	529	0.7881027	0.7841963	228	0.3419278	0.3402326	216
20	0.4950683	0.5026222	517	0.7802295	0.7762023	233	0.3385113	0.3367637	218
21	+0.5101368	+0.5176120	+505	−0.7721155	−0.7679688	+238	−0.3349903	−0.3331909	+220
22	0.5250467	0.5324409	493	0.7637630	0.7594982	243	0.3313658	0.3295152	222
23	0.5397936	0.5471047	481	0.7551748	0.7507933	247	0.3276392	0.3257380	224
24	0.5543733	0.5615993	469	0.7463538	0.7418569	251	0.3238117	0.3218605	225
25	0.5687818	0.5759207	457	0.7373029	0.7326919	255	0.3198846	0.3178840	227
26	+0.5830151	+0.5900647	+445	−0.7280247	−0.7233010	+258	−0.3158590	−0.3138096	+228
27	0.5970688	0.6040271	433	0.7185217	0.7136867	261	0.3117359	0.3096382	229
28	0.6109389	0.6178040	422	0.7087965	0.7038515	264	0.3075166	0.3053711	230
29	0.6240216	0.6313914	410	0.6988518	0.6937983	267	0.3032022	0.3010097	231
30	0.6381127	0.6447851	399	0.6886909	0.6835303	269	0.2987941	0.2965553	231
31	+0.6514080	+0.6579810	+388	−0.6783168	−0.6730506	+272	−0.2942936	−0.2920091	+231
Feb. 1	0.6645033	0.6709748	377	0.6677321	0.6623618	274	0.2897020	0.2873724	232
2	0.6773946	0.6837624	366	0.6569398	0.6514664	276	0.2850204	0.2826463	232
3	0.6900776	0.6963396	355	0.6459431	0.6403693	278	0.2802502	0.2778323	232
4	0.7025479	0.7087020	344	0.6347455	0.6290726	280	0.2753928	0.2729318	232
5	+0.7148014	+0.7208457	+333	−0.6233507	−0.6175805	+281	−0.2704497	−0.2679465	+231
6	0.7268344	0.7327669	322	0.6117622	0.6058965	282	0.2654225	0.2628779	231
7	0.7386430	0.7444618	312	0.5999836	0.5940243	283	0.2603128	0.2577276	230
8	0.7502232	0.7559263	301	0.5880188	0.5819678	284	0.2551223	0.2524973	229
9	0.7615710	0.7671566	291	0.5758717	0.5697312	285	0.2498525	0.2471885	228
10	+0.7726829	+0.7781493	+281	−0.5635466	−0.5573187	+286	−0.2445052	−0.2418031	+227
11	0.7835555	0.7889011	271	0.5510478	0.5447346	286	0.2390824	0.2363432	226
12	0.7941857	0.7994089	261	0.5383795	0.5319832	287	0.2335859	0.2308107	225
13	0.8045703	0.8096696	251	0.5255460	0.5190687	287	0.2280177	0.2252073	223
14	0.8147062	0.8196800	241	0.5125516	0.5059955	287	0.2223796	0.2195350	221
15	+0.8245903	+0.8294373	+232	−0.4994007	−0.4927680	+287	−0.2166733	−0.2137954	+219

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8245903	+0.8294373	+232	−0.4994007	−0.4927680	+287	−0.2166733	−0.2137954	+219
16	0.8342202	0.8389391	222	0.4860978	0.4793907	286	0.2109009	0.2079906	217
17	0.8435937	0.8481835	213	0.4726472	0.4658679	286	0.2050645	0.2021228	215
18	0.8527083	0.8571678	204	0.4590533	0.4522038	285	0.1991659	0.1961939	213
19	0.8615617	0.8658898	195	0.4453201	0.4384027	284	0.1932071	0.1902056	211
20	+0.8701518	+0.8743474	+186	−0.4314521	−0.4244689	+284	−0.1871898	−0.1841598	+209
21	0.8784764	0.8825385	177	0.4174536	0.4104067	284	0.1811159	0.1780583	206
22	0.8865334	0.8904610	168	0.4033287	0.3962202	283	0.1749873	0.1719031	204
23	0.8943209	0.8981130	160	0.3890817	0.3819138	282	0.1688059	0.1656960	201
24	0.9018370	0.9054926	152	0.3747169	0.3674916	281	0.1625735	0.1594388	198
25	+0.9090796	+0.9125977	+144	−0.3602382	−0.3529574	+279	−0.1562918	−0.1531331	+195
26	0.9160467	0.9194265	136	0.3456495	0.3383152	278	0.1499625	0.1467807	192
27	0.9227367	0.9259771	128	0.3309549	0.3235693	276	0.1435874	0.1403834	169
28	0.9291477	0.9322476	120	0.3161588	0.3087240	275	0.1371684	0.1339432	186
Mar. 1	0.9352770	0.9382359	113	0.3012656	0.2937840	273	0.1307075	0.1274619	182
2	+0.9411237	+0.9439400	+106	−0.2862799	−0.2787537	+271	−0.1242065	−0.1209415	+179
3	0.9466850	0.9493582	99	0.2712061	0.2636375	269	0.1176672	0.1143838	175
4	0.9519595	0.9544887	92	0.2560486	0.2484399	267	0.1110916	0.1077908	171
5	0.9569455	0.9593298	85	0.2408119	0.2331655	265	0.1044816	0.1011644	167
6	0.9616413	0.9638799	78	0.2255008	0.2178189	263	0.0978392	0.0945066	163
7	+0.9660453	+0.9681375	+ 72	−0.2101200	−0.2024051	+261	−0.0911664	−0.0878194	+159
8	0.9701561	0.9721012	65	0.1946745	0.1869292	259	0.0844654	0.0811051	155
9	0.9739725	0.9757698	59	0.1791696	0.1713964	257	0.0777385	0.0743660	151
10	0.9774933	0.9791425	53	0.1636102	0.1558116	255	0.0709877	0.0676041	147
11	0.9807176	0.9822183	47	0.1480011	0.1401797	253	0.0642152	0.0608217	142
12	+0.9836447	+0.9849965	+ 41	−0.1323476	−0.1245059	+251	−0.0574234	−0.0540210	+138
13	0.9862739	0.9874767	36	0.1166548	0.1087953	248	0.0506144	0.0472042	133
14	0.9886049	0.9896585	30	0.1009278	0.0930529	246	0.0437904	0.0403735	129
15	0.9906375	0.9915418	25	0.0851713	0.0772837	243	0 0369535	0.0335311	124
16	0.9923715	0.9931266	20	0.0693906	0.0614927	240	0.0301061	0.0266791	119
17	+0.9938070	+0.9944129	+ 15	−0.0535907	−0.0456849	+237	−0.0232503	−0.0198198	+114
18	0.9949441	0.9954011	10	0.0377761	0.0298647	234	0.0163881	0.0129553	109
19	0.9957834	0.9960915	6	0.0219513	−0.0140366	231	0.0095216	−0.0060875	104
20	0.9963256	0.9964845	+ 1	−0.0061211	+0.0017945	228	−0.0026530	+0.0007814	99
21	0.9965695	0.9965804	− 3	+0.0097096	0.0176237	224	+0.0042157	0.0076494	94
22	+0.9965170	+0.9963797	− 7	+0.0255361	+0.0334465	+221	+0.0110826	+0.0145146	+ 89
23	0.9961683	0.9958830	11	0.0413541	0.0492587	218	0.0179457	0.0213751	84
24	0.9955238	0.9950908	15	0.0571595	0.0650561	215	0.0248030	0.0282289	79
25	0.9945840	0.9940036	18	0.0729479	0.0808343	211	0.0316528	0.0350743	74
26	0.9933495	0.9926221	21	0.0887148	0.0965888	208	0.0384932	0.0419093	69
27	+0.9918212	+0.9909470	− 24	+0.1014558	+0.1123152	+204	+0.0453222	+0.0487320	+ 64
28	0.9899905	0.9889786	27	0.1201665	0.1280092	201	0.0521380	0.0555404	59
29	0.9878846	0.9867174	30	0.1358427	0.1436665	197	0.0589387	0.0623328	54
30	0.9854770	0.9841639	33	0.1514800	0.1592826	194	0.0657225	0.0691074	49
31	0.9827776	0.9813189	35	0.1670737	0.1748529	190	0.0724874	0.0758622	44
32	+0.9797873	+0.9781833	− 38	+0.1826194	+0.1903729	+186	+0.0792315	+0.0825952	+ 39

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9797873	+0.9781833	−38	+0.1826194	+0.1903729	+186	+0.0792315	+0.0825952	+ 39
2	0.9765069	0.9747579	40	0.1981126	0.2058381	182	0.0859530	0.0893045	34
3	0.9729368	0.9710433	42	0.2135486	0.2212437	178	0.0926498	0.0959882	28
4	0.9690778	0.9670404	43	0.2289226	0.2365849	174	0.0993198	0.1026441	23
5	0.9649312	0.9627507	45	0.2442299	0.2518570	170	0.1059609	0.1092701	18
6	+0.9604987	+0.9581756	−46	+0.2594656	+0.2670552	+167	+0.1125711	+0.1158640	+ 13
7	0.9557816	0.9533166	47	0.2746251	0.2821749	163	0.1191485	0.1224242	8
8	0.9507811	0.9481752	48	0.2897038	0.2972113	159	0.1256911	0.1289485	+ 2
9	0.9454990	0.9427532	49	0.3046968	0.3121598	155	0.1321966	0.1354347	− 3
10	0.9399375	0.9370528	50	0.3195995	0.3270157	150	0.1386629	0.1418808	8
11	+0.9340989	+0.9310763	−50	+0.3344074	+0.3417745	+146	+0.1450881	+0.1482848	− 14
12	0.9279851	0.9248257	50	0.3491161	0.3564318	142	0.1514704	0.1546448	19
13	0.9215983	0.9183033	50	0.3637209	0.3709830	138	0.1578077	0.1609588	24
14	0.9149410	0.9115117	50	0.3782174	0.3854237	133	0.1640980	0.1672249	29
15	0.9080158	0.9044536	49	0.3926015	0.3997501	129	0.1703394	0.1734413	34
16	+0.9008254	+0.8971316	−48	+0.4068693	+0.4139585	+125	+0.1765303	+0.1796063	− 39
17	0.8933726	0.8895485	47	0.4210172	0.4280450	121	0.1826690	0.1857182	44
18	0.8856599	0.8817069	46	0.4350413	0.4420056	116	0.1887537	0.1917753	49
19	0.8776899	0.8736093	45	0.4489375	0.4558364	112	0.1947829	0.1977761	54
20	0.8691654	0.8652585	43	0.4627020	0.4695339	107	0.2007549	0.2037189	59
21	+0.8609891	+0.8566573	−41	+0.4763315	+0.4830946	+103	+0.2066681	+0.2096022	− 64
22	0 8522637	0.8478085	39	0.4898227	0.4965153	98	0.2125211	0.2154246	68
23	0.8432921	0.8387148	37	0.5031720	0.5097924	94	0.2183124	0.2211845	73
24	0.8340769	0.8293787	34	0.5163759	0.5229222	89	0.2240404	0.2268803	77
25	0.8246206	0.8198028	32	0.5294307	0.5359012	85	0.2297037	0.2325107	81
26	+0.8149258	+0.8099898	−29	+0.5423330	+0.5487259	+ 80	+0.2353009	+0.2380743	− 85
27	0.8049952	0.7999424	26	0.5550794	0.5613930	76	0.2408305	0.2435695	89
28	0.7946315	0.7896631	22	0.5676666	0.5738992	71	0.2462910	0.2489949	94
29	0.7844376	0.7791554	19	0.5800910	0.5862410	67	0.2516809	0.2543489	98
30	0.7738166	0.7684217	15	0.5923492	0.5984147	63	0.2569987	0.2596301	103
May 1	+0.7629711	+0.7574650	−11	+0.6044374	+0.6104165	+ 59	+0.2622429	+0.2648369	−107
2	0.7519039	0.7462881	6	0.6163518	0.6222427	55	0.2674119	0.2699678	111
3	0.7406180	0.7348942	− 2	0.6280888	0.6338897	51	0.2725042	0.2750211	115
4	0.7291170	0.7232870	+ 3	0.6396449	0.6453541	47	0.2775181	0.2799953	119
5	0.7174045	0.7114700	8	0.6510168	0.6566326	43	0.2824522	0.2848889	123
6	+0.7054838	+0.6994465	+13	+0.6622010	+0.6677217	+ 40	+0.2873050	+0.2897005	−126
7	0.6933584	0.6872201	18	0.6731942	0.6786181	36	0.2920751	0.2944286	130
8	0.6810321	0.6747948	24	0.6839930	0.6893183	33	0.2967609	0.2990717	133
9	0.6685089	0.6621747	30	0.6945939	0.6998191	30	0.3013609	0.3036283	137
10	0.6557929	0.6493640	36	0.7049938	0.7101176	27	0.3058737	0.3080971	140
11	+0.6428884	+0.6363667	+42	+0.7151901	+0.7202111	+ 24	+0.3102981	+0.3124770	−143
12	0.6297994	0.6231869	48	0.7251801	0.7300968	21	0.3146331	0.3167667	146
13	0.6165300	0.6098290	55	0.7349609	0.7397719	18	0.3188773	0.3209649	149
14	0.6030846	0.5962972	62	0.7445295	0.7492335	16	0.3230292	0.3250703	151
15	0.5894674	0.5825957	69	0.7538835	0.7584794	13	0.3270878	0.3290819	154
16	+0.5756827	+0.5687289	+76	+0.7630208	+0.7675076	+ 11	+0.3310522	+0.3329089	−156

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 16	+0.5756827	+0.5687289	+ 76	+0.7630208	+0.7675076	+ 11	+0.3310522	+0.3329989	−156
17	0.5617348	0.5547011	83	0.7719394	0.7763162	8	0.3349215	0.3368204	158
18	0.5476282	0.5405168	91	0.7806375	0.7849031	6	0.3386950	0.3405456	160
19	0.5333671	0.5261799	99	0.7891129	0.7932663	4	0.3423717	0.3441736	162
20	0.5189554	0.5116942	107	0.7973633	0.8014036	+ 2	0.3459507	0.3477034	164
21	+0.5042968	+0.4970637	+115	+0.8053868	+0.8093129	0	+0.3494313	+0.3511343	−166
22	0.4896954	0.4822926	123	0.8131815	0.8169925	− 1	0.3528125	0.3544655	168
23	0.4748555	0.4673850	131	0.8207456	0.8244406	2	0.3560936	0.3576964	170
24	0.4598812	0.4523449	140	0.8280774	0.8316556	3	0.3592740	0.3608261	171
25	0.4447764	0.4371764	148	0.8351752	0.8386357	3	0.3623528	0.3638538	173
26	+0.4295451	+0.4218834	+157	+0.8420370	+0.8453788	− 4	+0.3653292	+0.3667787	−174
27	0.4141914	0.4064701	166	0.8486607	0.8518828	4	0.3682024	0.3696001	176
28	0.3987193	0.3909404	175	0.8550445	0.8581459	5	0.3709717	0.3723171	177
29	0.3831330	0.3752983	184	0.8611866	0.8641664	5	0.3736363	0.3749290	178
30	0.3674365	0.3595481	194	0.8670851	0.8699424	4	0.3761953	0.3774350	179
31	+0.3516339	+0.3436943	+203	+0.8727381	+0.8754719	− 4	+0.3786480	+0.3798342	−180
June 1	0.3357299	0.3277414	213	0.8781436	0.8807530	3	0.3809935	0.3821259	180
2	0.3197292	0.3116940	222	0.8832999	0.8857841	− 2	0.3832311	0.3843092	181
3	0.3036363	0.2955568	232	0.8882053	0.8905636	0	0.3853600	0.3863834	181
4	0.2874560	0.2793347	241	0.8928585	0.8950900	+ 1	0.3873794	0.3883478	181
5	+0.2711933	+0.2630326	+251	+0.8972579	+0.8993619	+ 3	+0.3892888	+0.3902019	−181
6	0.2548531	0.2466554	261	0.9014020	0.9033778	5	0.3910874	0.3919450	181
7	0.2384401	0.2302080	271	0.9052894	0.9071365	7	0.3927747	0.3935765	181
8	0.2219595	0.2136955	281	0.9089192	0.9106373	9	0.3943502	0.3950960	181
9	0.2054164	0.1971229	291	0.9122908	0.9138795	12	0.3958136	0.3965031	180
10	+0.1888156	+0.1804952	+301	+0.9154033	+0.9168622	+ 15	+0.3971644	+0.3977975	−179
11	0.1721622	0.1638174	311	0.9182560	0.9195847	19	0.3984024	0.3989769	178
12	0.1554613	0.1470946	321	0.9208482	0.9220464	22	0.3995272	0.4000471	177
13	0.1387179	0.1303318	330	0.9231794	0.9242471	26	0.4005386	0.4010019	176
14	0.1219368	0.1135337	340	0.9252495	0.9261866	30	0.4014366	0.4018432	174
15	+0.1051228	+0.0967050	+350	+0.9270583	+0.9278648	+ 35	+0.4022212	+0.4025710	−172
16	0.0882807	0.0798505	360	0.9286058	0.9292816	40	0.4028923	0.4031852	170
17	0.0714151	0.0629750	369	0.9298920	0.9304371	45	0.4034498	0.4036859	169
18	0.0545307	0.0460829	379	0.9309168	0.9313312	51	0.4038937	0.4040732	167
19	0.0376320	0.0291788	388	0.9316802	0.9319639	57	0.4042242	0.4043470	165
20	+0.0207237	+0.0122673	+397	+0.9321822	+0.9323353	+ 63	+0.4044413	+0.4045074	−163
21	+0.0038101	−0.0046474	406	0.9324230	0.9324455	69	0.4045450	0.4045545	161
22	−0.0131045	0.0215609	415	0.9324026	0.9322945	76	0.4045356	0.4044884	159
23	0.0300158	0.0384688	424	0.9321209	0.9318821	83	0.4044130	0.4043091	156
24	0.0469193	0.0553666	433	0.9315778	0.9312084	90	0.4041770	0.4040166	154
25	−0.0638103	−0.0722498	+442	+0.9307735	+0.9302734	+ 97	+0.4038277	+0.4036108	−151
26	0.0806845	0.0891140	451	0.9297080	0.9290773	105	0.4033654	0.4030918	148
27	0.0975377	0.1059549	459	0.9283814	0.9276202	113	0.4027900	0.4024598	145
28	0.1143653	0.1227679	467	0.9267938	0.9259021	121	0.4021015	0.4017148	142
29	0.1311621	0.1395475	475	0.9249451	0.9239230	129	0.4012999	0.4008567	139
30	−0.1479233	−0.1562891	+483	+0.9228356	+0.9216332	+137	+0.4003852	+0.3998855	−136

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.1646442	−0.1729880	+490	+0.9204656	+0.9191831	+146	+0.3993575	+0.3988014	−132
2	0.1813200	0.1896395	498	0.9178355	0.9164230	155	0.3982171	0.3976047	128
3	0.1979459	0.2062386	505	0.9149458	0.9134040	164	0.3969642	0.3962956	124
4	0.2145169	0.2227802	512	0.9117975	0.9101263	173	0.3955990	0.3948744	120
5	0.2310278	0.2392591	519	0.9083907	0.9065909	183	0.3941217	0.3933412	115
6	−0.2474735	−0.2556704	+526	+0.9047268	+0.9027988	+193	+0.3925327	+0.3916965	−111
7	0.2638490	0.2720090	532	0.9008068	0.8987511	203	0.3908325	0.3899409	106
8	0.2801495	0.2882703	538	0.8966318	0.8944491	213	0.3890215	0.3880747	102
9	0.2963704	0.3044495	544	0.8922032	0.8898943	224	0.3871003	0.3860986	97
10	0.3125068	0.3205417	550	0.8875225	0.8850882	235	0.3850695	0.3840133	93
11	−0.3285535	−0.3365417	+555	+0.8825913	+0.8800324	+246	+0.3829299	+0.3818196	− 88
12	0.3445057	0.3524450	560	0.8774114	0.8747287	257	0.3806823	0.3795183	83
13	0.3603591	0.3682475	565	0.8719843	0.8691787	268	0.3783275	0.3771101	78
14	0.3761096	0.3839449	570	0.8663119	0.8633843	279	0.3758661	0.3745957	73
15	0.3917529	0.3995329	574	0.8603961	0.8573476	291	0.3732989	0.3719760	68
16	−0.4072846	−0.4150073	+578	+0.8542389	+0.8510704	+302	+0.3706269	+0.3692519	− 63
17	0.4227006	0.4303640	581	0.8478422	0.8445546	314	0.3678510	0.3664243	57
18	0.4379970	0.4455092	584	0.8412078	0.8378021	326	0.3649719	0.3634941	51
19	0.4531699	0.4607088	587	0.8343376	0.8308148	338	0.3619906	0.3604620	45
20	0.4682151	0.4756885	589	0.8272337	0.8235948	350	0.3589079	0.3573289	39
21	−0.4831283	−0.4905342	+591	+0.8198980	+0.8161437	+362	+0.3557248	+0.3540958	− 32
22	0.4979057	0.5052424	593	0.8123322	0.8084636	374	0.3524420	0.3507635	26
23	0.5125438	0.5198095	594	0.8045380	0.8005559	387	0.3490603	0.3473327	19
24	0.5270388	0.5342314	594	0.7965173	0.7924227	399	0.3455805	0.3438042	13
25	0.5413866	0.5485040	595	0.7882722	0.7840662	412	0.3420035	0.3401789	7
26	−0.5555830	−0 5626233	+595	+0.7798047	+0.7754882	+424	+0.3383302	+0.3364576	− 1
27	0.5696241	0.5765852	595	0.7711167	0.7666906	437	0.3345613	0.3326411	+ 6
28	0.5835058	0.5903857	595	0.7622100	0.7576753	450	0.3306975	0.3287303	12
29	0.5972240	0 6040205	594	0.7530867	0.7484446	463	0.3267399	0.3247262	19
30	0.6107743	0.6174852	593	0.7437493	0.7390011	476	0.3226895	0.3206298	26
31	−0.6241524	−0.6307756	+591	+0.7342004	+0.7293473	+489	+0.3185473	+0.3164421	+ 33
Aug. 1	0.6373541	0.6438876	589	0.7244424	0.7194857	502	0.3143143	0.3121641	40
2	0.6503755	0.6568173	587	0.7144777	0.7094187	515	0.3099916	0.3077970	47
3	0.6632125	0.6695605	585	0.7043090	0.6991491	528	0.3055804	0.3033420	54
4	0.6758608	0.6821129	582	0.6939393	0.6886801	541	0.3010818	0.2988002	61
5	−0.6883164	−0.6944707	+579	+0.6833718	+0.6780148	+554	+0.2964971	+0.2941730	+ 68
6	0.7005756	0.7066303	574	0.6726094	0.6671562	566	0.2918278	0.2894619	75
7	0.7126316	0.7185879	570	0.6616553	0.6561076	579	0.2870753	0.2846684	82
8	0.7244897	0.7303397	565	0.6505132	0.6448728	591	0.2822411	0.2797938	90
9	0 7361373	0.7418823	560	0.6391866	0.6334552	604	0.2773265	0.2748396	97
10	−0.7475740	−0.7532124	+555	+0.6276787	+0.6218578	+616	+0.2723330	+0.2698072	+105
11	0.7587967	0.7643269	550	0.6159927	0.6100841	628	0.2672622	0.2646983	113
12	0.7698024	0.7752230	544	0.6041321	0.5981376	640	0.2621156	0.2595145	121
13	0.7805882	0.7858977	537	0.5921006	0.5860221	652	0.2568949	0.2542573	129
14	0.7911510	0.7963479	530	0.5799020	0.5737412	664	0.2516017	0.2489284	136
15	−0.8014879	−0.8065709	+523	+0.5675398	+0.5612984	+676	+0.2462375	+0.2435293	+144

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8115962	−0.8165639	+515	+0.5550174	+0.5486970	+688	+0.2408038	+0.2380614	+152
17	0.8214733	0.8263244	507	0.5423379	0.5359404	700	0.2353022	0.2325263	160
18	0.8311167	0.8358500	499	0.5295019	0.5230319	711	0.2297341	0.2269255	167
19	0.8405238	0.8451380	491	0.5165217	0.5099749	723	0.2241010	0.2212605	175
20	0.8496920	0.8541858	482	0.5033918	0.4967730	734	0.2184044	0.2155327	182
21	−0.8586187	−0.8629907	+472	+0.4901187	+0.4834295	+745	+0.2126457	+0.2097436	+190
22	0.8673013	0.8715503	462	0.4767057	0.4699476	756	0.2068264	0.2038946	198
23	0.8757372	0.8798619	452	0.4631560	0.4563309	767	0.2009480	0.1979872	206
24	0.8839239	0.8879229	442	0.4494732	0.4425829	777	0.1950121	0.1920230	213
25	0.8918586	0.8957306	431	0.4356608	0.4287072	787	0.1890200	0.1860034	221
26	−0.8995386	−0.9032823	+420	+0.4217226	+0.4147074	+797	+0.1829733	+0.1799300	+229
27	0.9069612	0.9105753	409	0.4076621	0.4005872	807	0.1768736	0.1738043	237
28	0.9141240	0.9176072	397	0.3934831	0.3863504	816	0.1707224	0.1676280	244
29	0.9210244	0.9243754	385	0.3791895	0.3720011	825	0.1645214	0.1614029	252
30	0.9276598	0.9308773	373	0.3647854	0.3575433	834	0.1582725	0.1551306	259
31	−0.9340276	−0.9371104	+360	+0.3502750	+0.3429812	+843	+0.1519773	+0.1488129	+267
Sept. 1	0.9401255	0.9430725	347	0.3356624	0.3283191	852	0.1456376	0.1424516	274
2	0.9459512	0.9487613	334	0.3209519	0.3135613	861	0.1392552	0.1360486	282
3	0.9515026	0.9541748	320	0.3061479	0.2987124	869	0.1328321	0.1296060	289
4	0.9567778	0.9593113	306	0.2912552	0.2837771	877	0.1263704	0.1231258	297
5	−0.9617752	−0.9641691	+292	+0.2762785	+0.2687600	+885	+0.1198721	+0.1166098	+304
6	0.9664930	0.9687465	278	0.2612222	0.2536655	893	0.1133390	0.1100601	312
7	0.9709296	0.9730421	263	0.2460907	0.2384982	900	0.1067732	0.1034787	319
8	0.9750838	0.9770544	248	0.2308886	0.2232626	907	0.1001767	0.0968677	326
9	0.9789539	0.9807823	233	0.2156206	0.2079634	913	0.0935516	0.0902290	332
10	−0.9825393	−0.9842249	+218	+0.2002914	+0.1926033	+919	+0.0869001	+0.0835651	+340
11	0.9858390	0.9873815	202	0.1849056	0.1771929	925	0.0802241	0.0768775	347
12	0.9888523	0.9902514	186	0.1694677	0.1617305	931	0.0735255	0.0701683	354
13	0.9915786	0.9928339	170	0.1539819	0.1462224	936	0.0668061	0.0634393	361
14	0.9940170	0.9951281	154	0.1384524	0.1306727	942	0.0600679	0.0566924	368
15	−0.9961669	−0.9971335	+137	+0.1228835	+0.1150857	+947	+0.0533128	+0.0499295	+375
16	0.9980277	0.9988497	120	0.1072797	0.0994661	952	0.0465426	0.0431526	382
17	0.9995991	1.0002761	103	0.0916457	0.0838184	956	0.0397596	0.0363637	388
18	1.0008804	1.0014120	86	0.0759853	0.0681469	960	0.0329652	0.0295645	395
19	1.0018707	1.0022566	68	0.0603036	0.0524554	964	0.0261616	0.0227568	402
20	−1.0025695	−1.0028096	+ 51	+0.0446033	+0.0367477	+968	+0.0193502	+0.0159422	+409
21	1.0029766	1.0030706	33	0.0288690	0.0210281	971	0.0125328	0.0091224	415
22	1.0030915	1.0030391	+ 15	+0.0131652	+0.0053012	974	+0.0057113	+0.0022998	421
23	1.0029135	1.0027145	− 3	−0.0025635	−0.0104282	977	−0.0011122	−0.0045241	427
24	1.0024420	1.0020961	21	0.0182924	0.0261556	979	0.0079359	0.0113472	433
25	−1.0016765	−1.0011835	− 40	−0.0340170	−0.0418766	+981	−0.0147579	−0.0181676	+439
26	1.0006168	0.9999765	58	0.0497333	0.0575870	983	0.0215762	0.0249834	445
27	0.9992625	0.9984748	77	0.0654368	0.0732821	984	0.0283890	0.0317926	450
28	0.9976133	0.9966781	96	0.0811223	0.0889567	985	0.0351942	0.0385931	456
29	0.9956691	0.9945865	115	0.0967847	0.1046058	986	0.0419896	0.0453829	461
30	−0.9934300	−0.9922000	−134	−0.1124193	−0.1202247	+986	−0.0487732	−0.0521598	+466

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.9908961	−0.9895188	− 154	−0.1280213	−0.1358086	+986	−0.0555428	−0.0589216	+471
2	0.9880678	0.9865436	173	0.1435860	0.1513527	986	0.0622962	0.0656661	476
3	0.9849459	0.9832751	193	0.1591083	0.1668519	986	0.0690313	0.0723913	480
4	0.9815312	0.9797143	213	0.1745831	0.1823012	986	0.0757460	0.0790950	484
5	0.9778246	0.9758621	233	0.1900054	0.1976955	985	0.0824380	0.0857749	488
6	−0.9738271	−0.9717195	− 253	−0.2053705	−0.2130301	+984	−0.0891053	−0.0924290	+492
7	0.9695397	0.9672877	273	0.2206735	0.2283002	982	0.0957456	0.0990550	496
8	0.9649637	0.9625679	293	0.2359097	0.2435011	980	0.1023568	0.1056509	500
9	0.9601005	0.9575618	313	0.2510741	0.2586279	978	0.1089369	0.1122146	504
10	0.9549518	0.9522710	333	0.2661621	0.2736762	976	0.1154837	0.1187441	508
11	−0.9495195	−0.9466975	− 354	−0.2811695	−0.2886417	+973	−0.1219953	−0.1252373	+511
12	0.9438053	0.9408430	374	0.2960921	0.3035203	970	0.1284700	0.1316930	514
13	0.9378109	0.9347092	395	0.3109256	0.3183076	967	0.1349060	0.1381088	517
14	0.9315381	0.9282978	415	0.3256655	0.3329991	963	0.1413012	0.1444829	520
15	0.9249884	0.9216103	436	0.3403075	0.3475906	959	0.1476537	0.1508134	523
16	−0.9181636	−0.9146487	− 457	−0.3548477	−0.3620783	+955	−0.1539618	−0.1570987	+526
17	0.9110657	0.9074151	478	0.3692819	0.3764579	950	0.1602239	0.1633371	528
18	0.9036968	0.8999114	499	0.3836058	0.3907252	945	0.1664381	0.1695267	530
19	0.8960587	0.8921393	520	0.3978155	0.4048764	940	0.1726027	0.1756658	532
20	0.8881530	0.8841003	541	0.4119071	0.4189074	934	0.1787159	0.1817528	534
21	−0.8799812	−0.8757962	− 562	−0.4258766	−0.4328142	+928	−0.1847762	−0.1877859	+535
22	0.8715452	0.8672290	583	0.4397196	0.4465924	922	0.1907817	0.1937633	537
23	0.8628473	0.8584009	604	0.4534319	0.4602377	916	0.1967305	0.1996831	538
24	0.8538897	0.8493140	625	0.4670092	0.4737458	910	0.2026208	0.2055434	539
25	0.8446743	0.8399705	646	0.4804470	0.4871123	903	0.2084508	0.2113425	539
26	−0.8352033	−0.8303727	− 667	−0.4937411	−0.5003328	+896	−0.2142186	−0.2170785	+540
27	0.8254792	0.8205229	689	0.5068869	0.5134029	888	0.2199222	0.2227494	540
28	0.8155044	0.8104238	710	0.5198801	0.5263183	880	0.2255597	0.2283531	540
29	0.8052816	0.8000781	731	0.5327167	0.5390750	872	0.2311294	0.2338883	541
30	0.7948136	0.7894887	752	0.5453926	0.5516688	864	0.2366295	0.2393528	541
31	−0.7841035	−0.7786587	− 774	−0.5579033	−0.5640953	+855	−0.2420581	−0.2447449	+540
Nov. 1	0.7731543	0.7675912	795	0.5702443	0.5763499	846	0.2474132	0.2500626	539
2	0.7619694	0.7562897	816	0.5824115	0.5884286	836	0.2526929	0.2553040	538
3	0.7505522	0.7447577	837	0.5944008	0.6003275	826	0.2578954	0.2604673	537
4	0.7389064	0.7329990	859	0.6062084	0.6120428	816	0.2630192	0.2655508	535
5	−0.7270358	−0.7210175	− 880	−0.6178303	−0.6235705	+805	−0.2680620	−0.2705528	+533
6	0.7149443	0.7088170	901	0.6292629	0.6349071	794	0.2730227	0.2754717	531
7	0.7026358	0.6964012	922	0.6405026	0.6460490	783	0.2778995	0.2803060	529
8	0.6901137	0.6837741	943	0.6515459	0.6569928	771	0.2826911	0.2850544	527
9	0.6773825	0.6709398	964	0.6623895	0.6677354	759	0.2873959	0.2897153	525
10	−0.6644462	−0.6579022	− 985	−0.6730303	−0.6782737	+747	−0.2920125	−0.2942874	+522
11	0.6513083	0.6446653	1006	0.6834652	0.6886046	734	0.2965397	0.2987694	519
12	0.6379733	0.6312331	1026	0.6936914	0.6987251	721	0.3009762	0.3031600	516
13	0.6244449	0.6176096	1047	0.7037055	0.7086324	708	0.3053206	0.3074579	513
14	0.6107272	0.6037987	1068	0.7135051	0.7183235	694	0.3095718	0.3116620	509
15	−0.5968242	−0.5898045	−1089	−0.7230873	−0.7277957	+680	−0.3137284	−0.3157710	+505

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5827398	−0.5756308	−1109	−0.7324485	−0.7370457	+665	−0.3177893	−0.3197836	+501
17	0.5684777	0.5612813	1129	0.7415867	0.7460713	650	0.3217534	0.3236988	497
18	0.5540417	0.5467598	1149	0.7504989	0.7548695	635	0.3256195	0.3275154	492
19	0.5394357	0.5320704	1169	0.7591824	0.7634375	620	0.3293864	0.3312323	487
20	0.5246640	0.5172175	1188	0.7676342	0.7717724	604	0.3330528	0.3348482	482
21	−0.5097310	−0.5022053	−1208	−0.7758516	−0.7798714	+587	−0.3366177	−0.3383618	+477
22	0.4946407	0.4870379	1227	0.7838315	0.7877318	570	0.3400798	0.3417720	471
23	0.4793972	0.4717193	1247	0.7915716	0.7953509	553	0.3434379	0.3450777	466
24	0.4640046	0.4562538	1266	0.7990690	0.8027259	535	0.3466909	0.3482777	460
25	0.4484674	0.4406461	1285	0.8063210	0.8098540	517	0.3498376	0.3513707	454
26	−0.4327903	−0.4249010	−1303	−0.8133246	−0.8167325	+499	−0.3528766	−0.3543554	+447
27	0.4169784	0.4090234	1321	0.8200772	0.8233587	480	0.3558068	0.3572308	441
28	0.4010364	0.3930182	1339	0.8265764	0.8297302	461	0.3586272	0.3599959	434
29	0.3849692	0.3768903	1357	0.8328197	0.8358447	442	0.3613367	0.3626496	427
30	0.3687819	0.3606450	1375	0.8388049	0.8417000	422	0.3639342	0.3651908	420
Dec. 1	−0.3524799	−0.3442877	−1392	−0.8445298	−0.8472940	+402	−0.3664188	−0.3676185	+413
2	0.3360687	0.3278238	1409	0.8499924	0.8526248	382	0.3687895	0.3699319	405
3	0.3195535	0.3112586	1426	0.8551910	0.8576906	361	0.3710455	0.3721302	397
4	0.3029397	0.2945976	1442	0.8601236	0.8624897	340	0.3731860	0.3742127	389
5	0.2862328	0.2778462	1458	0.8647887	0.8670206	318	0.3752103	0.3761787	381
6	−0.2694382	−0.2610098	−1474	−0.8691851	−0.8712820	+296	−0.3771179	−0.3780277	+373
7	0.2525614	0.2440939	1490	0.8733112	0.8752726	274	0.3789081	0.3797590	364
8	0.2356079	0.2271040	1505	0.8771661	0.8789915	251	0.3805804	0.3813723	355
9	0.2185829	0.2100453	1520	0.8807488	0.8824378	228	0.3821345	0.3828672	346
10	0.2014918	0.1929232	1534	0.8840585	0.8856107	204	0.3835701	0.3842434	337
11	−0.1843400	−0.1757430	−1548	−0.8870945	−0.8885096	+180	−0.3848868	−0.3855005	+327
12	0.1671326	0.1585097	1562	0.8898561	0.8911337	156	0.3860843	0.3866383	317
13	0.1498746	0.1412283	1575	0.8923425	0.8934823	131	0.3871624	0.3876565	307
14	0.1325711	0.1239039	1588	0.8945531	0.8955548	106	0.3881208	0.3885550	297
15	0.1152271	0.1065415	1600	0.8964872	0.8973505	81	0.3889593	0.3893335	287
16	−0.0978475	−0.0891461	−1612	−0.8981444	−0.8988690	+ 55	−0.3896777	−0.3899918	+276
17	0.0804375	0.0717229	1624	0.8995241	0.9001097	29	0.3902757	0.3905296	266
18	0.0630023	0.0542767	1635	0.9006256	0.9010718	+ 3	0.3907532	0.3909467	255
19	0.0455465	0.0368125	1645	0.9014483	0.9017549	− 23	0.3911099	0.3912429	244
20	0.0280752	0.0193355	1655	0.9019917	0.9021585	50	0.3913456	0.3914181	233
21	−0.0105938	−0.0018512	−1665	−0.9022555	−0.9022824	− 77	−0.3914602	−0.3914721	+222
22	+0.0068920	+0.0156349	1674	0.9022393	0.9021261	104	0.3914535	0.3914046	210
23	0.0243771	0.0331177	1683	0.9019428	0.9016893	132	0.3913253	0.3912155	198
24	0.0418562	0.0505919	1691	0.9013655	0.9009715	160	0.3910753	0.3909046	186
25	0.0593241	0.0680520	1699	0.9005072	0.8999726	188	0.3907035	0.3904719	174
26	+0.0767750	+0.0854923	−1706	−0.8993677	−0.8986926	−216	−0.3902099	−0.3899174	+162
27	0.0942032	0.1029070	1712	0.8979472	0.8971318	245	0.3895944	0.3892410	150
28	0.1116031	0.1202905	1718	0.8962462	0.8952907	274	0.3888571	0.3884429	137
29	0.1289688	0.1376371	1723	0.8942651	0.8931696	303	0.3879982	0.3875232	125
30	0.1462946	0.1549408	1728	0.8920042	0.8907690	332	0.3870178	0.3864821	112
31	+0.1635747	+0.1721959	−1732	−0.8894640	−0.8880895	−361	−0.3859161	−0.3853199	+ 99
32	+0.1808034	+0.1893967	−1735	−0.8866454	−0.8851321	−391	−0.3846935	−0.3840371	+ 86

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	169° 40′ 14″.9	+5° 12′ 5″.3	1.0	214° 24′ 16″.7	+3° 9′ 7″.5	1.0	223° 28′ 37″.6	+2° 13′ 6″.3
1.5	175 37 44.3	5 7 24.1	1.5	220 38 0.2	2 41 57.4	1.5	229 42 22.8	1 42 53.8
2.0	181 36 55.8	4 59 21.2	2.0	226 56 26.0	2 12 28.7	2.0	236 0 3.6	1 11 5.8
2.5	187 38 24.1	4 47 57.7	2.5	233 20 9.8	1 40 56.2	2.5	242 22 12.3	0 38 1.1
3.0	193 42 44.7	4 33 16.0	3.0	239 49 46.0	1 7 37.3	3.0	248 49 21.4	+0 4 0.5
3.5	199 50 33.8	+4 15 19.4	3.5	246 25 45.5	+0 32 52.6	3.5	255 22 2.3	—0 30 32.4
4.0	206 2 27.1	3 54 12.6	4.0	253 8 35.0	—0 2 53.7	4.0	262 0 44.7	1 5 12.0
4.5	212 18 59.1	3 30 2.4	4.5	259 58 34.9	0 39 13.8	4.5	268 45 54.2	1 39 29.8
5.0	218 40 42.7	3 2 57.7	5.0	266 55 57.6	1 15 36.0	5.0	275 37 51.6	2 12 54.9
5.5	225 8 7.9	2 33 10.4	5.5	274 0 45.4	1 51 24.7	5.5	282 36 49.8	2 44 53.9
6.0	231 41 40.3	+2 0 55.4	6.0	281 12 48.7	—2 26 1.3	6.0	289 42 52.6	—3 14 51.3
6.5	238 21 40.4	1 26 31.5	6.5	288 31 45.0	2 58 44.6	6.5	296 55 52.8	3 42 10.7
7.0	245 8 21.8	0 50 21.8	7.0	295 56 57.7	3 28 52.8	7.0	304 15 30.2	4 6 15.5
7.5	252 1 50.4	+0 12 53.9	7.5	303 27 35.7	3 55 44.4	7.5	311 41 10.4	4 26 30.3
8.0	259 2 2.6	—0 25 20.1	8.0	311 2 34.6	4 18 40.7	8.0	319 12 5.0	4 42 23.2
8.5	266 8 44.6	—1 3 43.9	8.5	318 40 39.2	—4 37 8.3	8.5	326 47 12.1	—4 53 27.1
9.0	273 21 31.8	1 41 36.8	9.0	326 20 25.4	4 50 40.2	9.0	334 25 17.7	4 59 21.8
9.5	280 39 48.4	2 18 16.4	9.5	334 0 25.1	4 58 58.0	9.5	342 4 59.0	4 59 55.2
10.0	288 2 47.9	2 52 58.6	10.0	341 39 8.9	5 1 52.9	10.0	349 44 47.9	4 55 4.9
10.5	295 29 34.0	3 24 59.9	10.5	349 15 12.3	4 59 25.5	10.5	357 23 15.1	4 44 58.0
11.0	302 59 2.7	—3 53 39.5	11.0	356 47 18.1	—4 51 45.7	11.0	4 58 54.7	—4 29 50.8
11.5	310 30 4.6	4 18 21.0	11.5	4 14 20.2	4 39 11.6	11.5	12 30 27.8	4 10 8.0
12.0	318 1 27.6	4 38 34.0	12.0	11 35 25.8	4 22 7.9	12.0	19 56 46.9	3 46 20.8
12.5	325 32 0.0	4 53 55.9	12.5	18 49 56.2	4 1 4.1	12.5	27 16 56.6	3 19 4.8
13.0	333 0 33.7	5 4 12.0	13.0	25 57 26.9	3 36 32.5	13.0	34 30 16.1	2 48 58.9
13.5	340 26 7.5	—5 9 16.2	13.5	32 57 46.7	—3 9 7.0	13.5	41 36 19.1	—2 16 41.8
14.0	347 47 48.1	5 9 10.2	14.0	39 50 56.4	2 39 21.6	14.0	48 34 52.8	1 42 52.2
14.5	355 4 52.0	5 4 3.3	14.5	46 37 6.8	2 7 49.4	14.5	55 25 57.0	1 8 6.4
15.0	2 16 46.8	4 54 10.6	15.0	53 16 37.1	1 35 2.0	15.0	62 9 42.0	—0 32 58.0
15.5	9 23 10.9	4 39 52.3	15.5	59 49 52.4	1 1 28.9	15.5	68 46 27.2	+0 2 2.5
16.0	16 23 52.6	—4 21 32.2	16.0	66 17 22.1	—0 27 37.4	16.0	75 16 38.8	+0 36 27.8
16.5	23 18 49.5	3 59 36.4	16.5	72 39 38.3	+0 6 7.1	16.5	81 40 47.7	1 9 54.0
17.0	30 8 6.6	3 34 32.7	17.0	78 57 14.3	0 39 21.4	17.0	87 59 28.7	1 42 0.1
17.5	36 51 55.2	3 6 49.6	17.5	85 10 43.7	1 11 44.2	17.5	94 13 18.1	2 12 27.8
18.0	43 30 31.7	2 36 55.5	18.0	91 20 39.2	1 42 56.1	18.0	100 22 53.4	2 41 1.1
18.5	50 4 15.6	—2 5 18.6	18.5	97 27 32.3	+2 12 38.9	18.5	106 28 51.8	+3 7 25.7
19.0	56 33 28.5	1 32 26.4	19.0	103 31 52.2	2 40 36.3	19.0	112 31 49.3	3 31 29.5
19.5	62 58 33.4	0 58 45.6	19.5	109 34 5.3	3 6 33.0	19.5	118 32 20.7	3 53 1.3
20.0	69 19 53.3	—0 24 42.0	20.0	115 34 35.8	3 30 15.2	20.0	124 30 58.2	4 11 51.6
20.5	75 37 49.7	+0 9 19.9	20.5	121 33 45.1	3 51 30.2	20.5	130 28 12.0	4 27 51.9
21.0	81 52 43.4	+0 42 56.5	21.0	127 31 51.9	+4 10 6.7	21.0	136 24 29.5	+4 40 54.6
21.5	88 4 53.7	1 15 45.2	21.5	133 29 12.4	4 25 54.7	21.5	142 20 15.0	4 50 53.4
22.0	94 14 37.8	1 47 24.9	22.0	139 26 0.3	4 38 45.8	22.0	148 15 50.4	4 57 42.9
22.5	100 22 11.2	2 17 35.9	22.5	145 22 27.8	4 48 32.9	22.5	154 11 35.0	5 1 19.4
23.0	106 27 47.5	2 45 59.7	23.0	151 18 45.5	4 55 10.5	23.0	160 7 44.6	5 1 40.1
23.5	112 31 38.6	+3 12 19.5	23.5	157 15 2.9	+4 58 34.9	23.5	166 4 33.9	+4 58 43.7
24.0	118 33 55.4	3 36 19.9	24.0	163 11 29.5	4 58 43.9	24.0	172 2 14.9	4 52 30.8
24.5	124 34 47.6	3 57 47.5	24.5	169 8 14.2	4 55 37.0	24.5	178 0 58.2	4 43 3.2
25.0	130 34 24.6	4 16 30.7	25.0	175 5 27.0	4 49 15.6	25.0	184 0 53.3	4 30 25.1
25.5	136 32 55.5	4 32 19.5	25.5	181 3 18.8	4 39 42.6	25.5	190 2 8.9	4 14 42.0
26.0	142 30 30.0	+4 45 5.8	26.0	187 2 1.9	+4 27 2.6	26.0	196 4 53.7	+3 56 1.7
26.5	148 27 18.9	4 54 43.3	26.5	193 1 50.7	4 11 21.8	26.5	202 9 16.5	3 34 33.9
27.0	154 23 33.9	5 1 7.8	27.0	199 3 2.1	3 52 47.9	27.0	208 15 26.8	3 10 30.0
27.5	160 19 28.7	5 4 16.2	27.5	205 5 55.3	3 31 30.0	27.5	214 23 35.5	2 44 3.5
28.0	166 15 18.8	5 4 7.1	28.0	211 10 52.0	3 7 38.8	28.0	220 33 55.0	2 15 29.6
28.5	172 11 22.3	5 0 40.7	28.5	217 18 17.1	2 41 26.4	28.5	226 46 39.4	1 45 5.4
29.0	178 7 59.6	+4 53 58.6	29.0	223 28 37.6	+2 13 6.3	29.0	233 2 4.8	+1 13 9.5
29.5	184 5 34.2	4 44 3.4	29.5	229 42 22.8	1 42 53.8	29.5	239 20 29.3	0 40 2.3
30.0	190 4 31.9	4 30 59.0	30.0	236 0 3.6	1 11 5.8	30.0	245 42 12.7	+0 6 5.5
30.5	196 5 20.9	4 14 50.3	30.5	242 22 12.3	0 38 1.1	30.5	252 7 36.2	—0 28 17.3
31.0	202 8 32.3	3 55 43.6	31.0	248 49 21.4	+0 4 0.5	31.0	258 37 2.0	1 2 41.3
31.5	208 14 39.3	+3 33 16.1	31.5	255 22 2.3	—0 30 32.1	31.5	265 10 52.7	—1 36 40.1

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	271° 49′ 29″.9	—2° 9′ 45″.9	1.0	309° 47′ 53″.2	—4° 42′ 59″.4	1.0	3° 25′ 38″.5	—4° 39′ 41″.8
1.5	278 33 13.6	2 41 29.8	1.5	316 50 46.9	4 57 33.9	1.5	10 32 34.4	4 19 9.8
2.0	285 22 21.0	3 11 21.7	2.0	323 57 9.1	5 7 43.1	2.0	17 38 35.4	3 54 41.5
2.5	292 17 4.4	3 38 50.8	2.5	331 6 44.5	5 13 11.0	2.5	24 43 19.1	3 26 41.9
3.0	299 17 30.1	4 3 26.2	3.0	338 19 11.6	5 13 46.2	3.0	31 46 22.5	2 55 39.8
3.5	306 23 37.0	—4 24 37.4	3.5	345 34 3.1	—5 9 22.6	3.5	38 47 22.7	2 22 7.3
4.0	313 35 15.0	4 41 55.2	4.0	352 50 45.9	4 59 59.9	4.0	45 45 57.1	1 46 38.7
4.5	320 52 3.8	4 54 53.3	4.5	0 8 41.5	4 45 44.6	4.5	52 41 43.6	1 9 49.6
5.0	328 13 32.2	5 3 9.0	5.0	7 27 6.7	4 26 49.4	5.0	59 34 21.5	—0 32 16.3
5.5	335 38 58.0	5 6 25.0	5.5	14 45 14.9	4 3 33.8	5.5	66 23 31.7	+0 5 25.6
6.0	343 7 28.6	—5 4 30.2	6.0	22 2 17.9	—3 36 23.5	6.0	73 8 57.7	+0 42 41.6
6.5	350 38 2.3	4 57 21.2	6.5	29 17 27.4	3 5 49.6	6.5	79 50 25.7	1 18 59.5
7.0	358 9 31.0	4 45 2.8	7.0	36 29 56.3	2 32 27.3	7.0	86 27 45.1	1 53 49.7
7.5	5 40 42.0	4 27 48.4	7.5	43 39 1.1	1 56 54.8	7.5	93 0 49.1	2 26 46.0
8.0	13 10 22.0	4 5 59.9	8.0	50 44 2.9	1 19 52.0	8.0	99 29 34.8	2 57 25.5
8.5	20 37 20.4	—3 40 5.5	8.5	57 44 28.5	—0 41 58.9	8.5	105 54 3.4	+3 25 28.9
9.0	28 0 31.6	3 10 40.1	9.0	64 39 51.6	—0 3 54.2	9.0	112 14 20.1	3 50 40.6
9.5	35 18 58.0	2 38 22.3	9.5	71 29 53.1	+0 33 45.7	9.5	118 30 34.5	4 12 48.2
10.0	42 31 52.1	2 3 52.9	10.0	78 14 21.2	1 10 27.5	10.0	124 43 0.0	4 31 42.5
10.5	49 38 37.4	1 27 53.5	10.5	84 53 11.5	1 45 41.6	10.5	130 51 54.0	4 47 17.0
11.0	56 38 49.0	—0 51 4.2	11.0	91 26 26.4	+2 19 2.3	11.0	136 57 37.4	+4 59 27.5
11.5	63 32 13.2	—0 14 2.8	11.5	97 54 14.9	2 50 8.3	11.5	143 0 34.2	5 8 11.6
12.0	70 18 46.7	+0 22 36.2	12.0	104 16 51.9	3 18 41.5	12.0	149 1 11.3	5 13 28.8
12.5	76 58 36.0	0 58 22.0	12.5	110 34 36.7	3 44 27.6	12.5	154 59 57.8	5 15 19.9
13.0	83 31 55.5	1 32 47.8	13.0	116 47 53.4	4 7 15.6	13.0	160 57 25.1	5 13 46.6
13.5	89 59 6.6	+2 5 30.8	13.5	122 57 9.4	+4 26 56.8	13.5	166 54 6.3	+5 8 51.6
14.0	96 20 35.9	2 36 11.6	14.0	129 2 54.8	4 43 25.0	14.0	172 50 35.4	5 0 38.5
14.5	102 36 54.2	3 4 34.1	14.5	135 5 41.5	4 56 35.6	14.5	178 47 27.3	4 49 11.4
15.0	108 48 35.2	3 30 25.1	15.0	141 6 3.3	5 6 25.6	15.0	184 45 17.2	4 34 35.3
15.5	114 56 14.1	3 53 33.6	15.5	147 4 34.4	5 12 53.2	15.5	190 44 40.1	4 16 56.2
16.0	121 0 27.2	+4 13 50.7	16.0	153 1 49.4	+ 5 15 57.5	16.0	196 46 10.7	+3 56 21.1
16.5	127 1 50.9	4 31 9.1	16.5	158 58 23.1	5 15 38.5	16.5	202 50 22.1	3 32 58.2
17.0	133 1 1.2	4 45 22.8	17.0	164 54 49.1	5 11 57.0	17.0	208 57 45.8	3 6 57.6
17.5	138 58 32.9	4 56 26.7	17.5	170 51 40.5	5 4 54.7	17.5	215 8 51.2	2 38 30.9
18.0	144 54 59.4	5 4 17.1	18.0	176 49 28.6	4 54 34.0	18.0	221 24 4.8	2 7 52.5
18.5	150 50 52.2	+5 8 50.8	18.5	182 48 43.2	+4 40 58.6	18.5	227 43 49.4	+1 35 18.8
19.0	156 46 40.5	5 10 5.9	19.0	188 49 52.2	4 24 13.3	19.0	234 8 23.8	1 1 9.5
19.5	162 42 51.4	5 8 1.1	19.5	194 53 20.8	4 4 24.5	19.5	240 38 1.8	+0 25 47.1
20.0	168 39 49.2	5 2 36.5	20.0	200 59 31.8	3 41 40.3	20.0	247 12 52.0	—0 10 22.8
20.5	174 37 55.9	4 53 53.5	20.5	207 8 45.0	3 16 11.0	20.5	253 52 56.8	0 46 51.3
21.0	180 37 30.6	+4 41 54.6	21.0	213 21 17.2	+2 48 9.0	21.0	260 38 12.5	—1 23 7.1
21.5	186 38 50.3	4 26 44.4	21.5	219 37 22.2	2 17 49.5	21.5	267 28 28.7	1 58 36.5
22.0	192 42 9.3	4 8 28.9	22.0	225 57 10.4	1 45 30.1	22.0	274 23 28.8	2 32 44.2
22.5	198 47 39.7	3 47 16.4	22.5	232 20 48.6	1 11 31.5	22.5	281 22 49.6	3 4 54.6
23.0	204 55 31.5	3 23 17.4	23.0	238 48 20.6	0 36 16.9	23.0	288 26 2.5	3 34 32.4
23.5	211 5 53.3	+2 56 44.6	23.5	245 19 47.1	+0 0 12.3	23.5	295 32 34.0	—4 1 4.0
24.0	217 18 52.4	2 27 52.9	24.0	251 55 5.5	—0 36 13.9	24.0	302 41 46.6	4 23 58.9
24.5	223 34 34.7	1 56 59.8	24.5	258 34 10.4	1 12 31.5	24.5	309 53 0.6	4 42 49.9
25.0	229 53 5.7	1 24 25.1	25.0	265 16 53.9	1 48 8.7	25.0	317 5 35.1	4 57 15.6
25.5	236 14 30.6	0 50 30.4	25.5	272 3 6.0	2 22 33.1	25.5	324 18 49.6	5 6 59.5
26.0	242 38 54.5	+0 15 39.6	26.0	278 52 34.6	—2 55 11.8	26.0	331 32 5.2	—5 11 51.5
26.5	249 6 22.8	—0 19 41.7	26.5	285 45 6.1	3 25 32.9	26.5	338 44 45.9	5 11 47.4
27.0	255 37 1.1	0 55 6.5	27.0	292 40 25.8	3 53 5.9	27.0	345 56 19.4	5 6 49.2
27.5	262 10 55.6	1 30 6.7	27.5	299 38 17.8	4 17 22.3	27.5	353 6 17.9	4 57 4.7
28.0	268 48 12.6	2 4 13.3	28.0	306 38 25.7	4 37 56.2	28.0	0 14 18.2	4 42 46.9
28.5	275 28 58.6	2 36 57.1	28.5	313 40 32.4	4 54 25.4	28.5	7 20 1.7	4 24 13.1
29.0	282 13 19.7	—3 7 48.3	29.0	320 44 20.7	—5 6 31.7	29.0	14 23 14.1	—4 1 45.1
29.5	289 1 21.2	3 36 17.7	29.5	327 49 32.8	5 14 1.0	29.5	21 23 45.0	3 35 47.7
30.0	295 53 6.8	4 1 57.2	30.0	334 55 50.4	5 16 44.0	30.0	28 21 27.1	3 6 48.5
30.5	302 48 38.0	4 24 19.6	30.5	342 2 55.2	5 14 36.3	30.5	35 16 15.8	2 35 17.1
31.0	309 47 53.2	4 42 59.4	31.0	349 10 28.1	5 7 38.6	31.0	42 8 8.2	2 1 44.4
31.5	316 50 46.9	—4 57 33.9	31.5	356 18 9.4	—4 55 56.7	31.5	48 57 2.7	—1 26 42.5

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	42 8 8.2	−2 1 44.4	1.0	91 52 48.6	+2 25 5.2	1.0	138 24 46.3	+4 53 39.3
1.5	48 57 2.7	1 26 42.5	1.5	98 13 40.4	2 53 40.7	1.5	144 26 2.7	4 58 22.7
2.0	55 42 58.2	0 50 43.4	2.0	104 31 49.4	3 19 53.5	2.0	150 25 55.0	4 59 45.8
2.5	62 25 53.7	−0 14 19.3	2.5	110 47 23.9	3 43 28.0	2.5	156 24 32.7	4 57 49.9
3.0	69 5 48.0	+0 21 58.6	3.0	117 0 31.2	4 4 10.9	3.0	162 22 5.0	4 52 38.1
3.5	75 42 39.9	+0 57 40.1	3.5	123 11 17.3	+4 21 51.5	3.5	168 18 41.5	+4 44 15.1
4.0	82 16 27.6	1 32 16.7	4.0	129 19 47.7	4 36 21.1	4.0	174 14 32.5	4 32 47.0
4.5	88 47 9.0	2 5 21.9	4.5	135 26 8.1	4 47 33.7	4.5	180 9 49.4	4 18 21.8
5.0	95 14 42.2	2 36 32.0	5.0	141 30 24.6	4 55 25.5	5.0	186 4 45.6	4 1 8.6
5.5	101 39 6.0	3 5 25.4	5.5	147 32 44.1	4 59 54.8	5.5	191 59 36.5	3 41 17.7
6.0	108 0 19.9	+3 31 43.7	6.0	153 33 15.2	+5 1 2.0	6.0	197 54 39.7	+3 19 0.7
6.5	114 18 24.4	3 55 11.3	6.5	159 32 8.5	4 58 49.4	6.5	203 50 15.5	2 54 30.1
7.0	120 33 22.0	4 15 36.1	7.0	165 29 36.8	4 53 20.8	7.0	209 46 46.8	2 27 59.4
7.5	126 45 17.2	4 32 48.2	7.5	171 25 55.4	4 44 41.7	7.5	215 44 39.6	1 59 43.0
8.0	132 54 17.0	4 46 40.7	8.0	177 21 22.5	4 32 58.7	8.0	221 44 22.4	1 29 56.2
8.5	139 0 31.3	+4 57 9.6	8.5	183 16 19.3	+4 18 19.5	8.5	227 46 26.1	+0 58 55.2
9.0	145 4 12.8	5 4 12.3	9.0	189 11 10.0	4 0 53.0	9.0	233 51 24.2	+0 26 57.3
9.5	151 5 37.3	5 7 49.3	9.5	195 6 21.7	3 40 48.8	9.5	239 59 51.9	−0 5 39.1
10.0	157 5 3.7	5 8 1.9	10.0	201 2 24.5	3 18 17.2	10.0	246 12 25.6	0 38 34.3
10.5	163 2 54.0	5 4 53.3	10.5	206 59 51.1	2 53 29.6	10.5	252 29 42.2	1 11 27.0
11.0	168 59 33.2	+4 58 27.5	11.0	212 59 16.4	+2 26 38.0	11.0	258 52 18.2	−1 43 54.3
11.5	174 55 29.3	4 48 49.9	11.5	219 1 17.4	1 57 55.8	11.5	265 20 48.6	2 15 31.6
12.0	180 51 12.6	4 36 6.7	12.0	225 6 32.1	1 27 37.2	12.0	271 55 45.1	2 45 52.3
12.5	186 47 15.6	4 20 24.5	12.5	231 15 40.1	0 55 57.9	12.5	278 37 35.3	3 14 27.8
13.0	192 44 13.1	4 1 50.9	13.0	237 29 20.4	+0 23 15.5	13.0	285 26 40.2	3 40 48.2
13.5	198 42 41.1	+3 40 34.6	13.5	243 48 11.2	−0 10 10.6	13.5	292 23 12.6	−4 4 22.4
14.0	204 43 16.7	3 16 44.8	14.0	250 12 48.9	0 43 58.6	14.0	299 27 15.5	4 24 38.7
14.5	210 46 37.6	2 50 32.1	14.5	256 43 45.9	1 17 44.4	14.5	306 38 39.5	4 41 6.1
15.0	216 53 21.4	2 22 8.3	15.0	263 21 30.6	1 51 0.5	15.0	313 57 2.4	4 53 15.9
15.5	223 4 4.9	1 51 47.0	15.5	270 6 24.2	2 23 18.2	15.5	321 21 47.7	5 0 42.5
16.0	229 19 23.3	+1 19 43.9	16.0	276 58 40.0	−2 54 4.7	16.0	328 52 4.9	−5 3 5.8
16.5	235 39 49.0	0 46 17.0	16.5	283 58 21.0	3 22 46.2	16.5	336 26 50.2	5 0 12.7
17.0	242 5 51.0	+0 11 47.0	17.0	291 5 18.7	3 48 47.5	17.0	344 4 49.0	4 51 58.4
17.5	248 37 53.5	−0 23 22.6	17.5	298 19 12.0	4 11 33.7	17.5	351 44 38.6	4 38 27.5
18.0	255 16 14.8	0 58 44.9	18.0	305 39 26.1	4 30 30.7	18.0	359 24 51.9	4 19 54.1
18.5	262 1 5.9	−1 33 50.2	18.5	313 5 13.0	−4 45 7.7	18.5	7 4 1.8	−3 56 41.5
19.0	268 52 29.3	2 8 5.8	19.0	320 35 32.2	4 54 59.1	19.0	14 40 44.9	3 29 21.2
19.5	275 50 17.9	2 40 56.7	19.5	328 9 12.9	4 59 45.9	19.5	22 13 45.6	2 58 30.9
20.0	282 54 14.9	3 11 46.5	20.0	335 44 56.9	4 59 16.7	20.0	29 41 58.3	2 24 52.7
20.5	290 3 52.9	3 39 58.4	20.5	343 21 22.1	4 53 29.4	20.5	37 4 30.3	1 49 10.8
21.0	297 18 34.1	−4 4 56.4	21.0	350 57 6.1	−4 42 31.2	21.0	44 20 42.2	−1 12 9.2
21.5	304 37 31.3	4 26 7.3	21.5	358 30 50.5	4 26 37.3	21.5	51 30 7.9	−0 34 30.5
22.0	311 59 49.6	4 43 1.9	22.0	6 1 23.7	4 6 12.0	22.0	58 32 33.9	+0 3 5.5
22.5	319 24 27.8	4 55 16.4	22.5	13 27 44.7	3 41 44.7	22.5	65 27 58.4	0 40 3.2
23.0	326 50 21.6	5 2 33.9	23.0	20 49 4.2	3 13 50.0	23.0	72 16 28.7	1 15 50.9
23.5	334 16 26.0	−5 4 45.1	23.5	28 4 45.0	−2 43 5.1	23.5	78 58 20.4	+1 50 1.3
24.0	341 41 38.1	5 1 48.5	24.0	35 14 23.1	2 10 8.5	24.0	85 33 55.3	2 22 11.4
24.5	349 4 59.9	4 53 50.3	24.5	42 17 45.9	1 35 38.4	24.5	92 3 39.3	2 52 1.8
25.0	356 25 40.2	4 41 3.6	25.0	49 14 51.5	1 0 11.5	25.0	98 28 1.4	3 19 16.7
25.5	3 42 56.1	4 23 47.9	25.5	56 5 46.5	−0 24 22.3	25.5	104 47 32.2	3 43 43.1
26.0	10 56 14.2	−4 2 27.7	26.0	62 50 44.9	+0 11 17.1	26.0	111 2 43.0	+4 5 10.8
26.5	18 5 10.1	3 37 31.3	26.5	69 30 5.8	0 46 17.6	26.5	117 14 4.5	4 23 31.7
27.0	25 9 28.7	3 9 29.4	27.0	76 4 11.7	1 20 13.0	27.0	123 22 6.8	4 38 39.5
27.5	32 9 2.9	2 38 54.3	27.5	82 33 27.6	1 52 39.8	27.5	129 27 18.4	4 50 29.7
28.0	39 3 52.6	2 6 18.8	28.0	88 58 19.2	2 23 17.3	28.0	135 30 5.9	4 58 59.4
28.5	45 54 3.4	1 32 15.7	28.5	95 19 11.7	2 51 47.1	28.5	141 30 53.6	5 4 7.2
29.0	52 39 44.9	−0 57 17.0	29.0	101 36 30.3	+3 17 53.3	29.0	147 30 3.8	+5 5 52.7
29.5	59 21 10.2	−0 21 53.4	29.5	107 50 38.3	3 41 22.1	29.5	153 27 56.8	5 4 17.4
30.0	65 58 33.6	+0 13 25.5	30.0	114 1 56.7	4 2 1.7	30.0	159 24 50.5	4 59 24.1
30.5	72 32 10.4	0 48 11.9	30.5	120 10 44.8	4 19 42.2	30.5	165 21 0.9	4 51 16.0
31.0	79 2 15.9	1 21 59.7	31.0	126 17 19.5	4 34 15.8	31.0	171 16 42.7	4 39 59.7
31.5	85 29 4.3	+1 54 24.8	31.5	132 21 55.7	+4 45 36.2	31.5	177 12 9.3	+4 25 41.6

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	171° 16′ 42″.7	+4° 39′ 59″.7	1.0	215° 46′ 10″.9	+1° 50′ 18″.3	1.0	249° 9′ 52″.1	−1° 10′ 54″.2
1.5	177 12 9.3	4 25 41.6	1.5	221 49 19.7	1 18 26.3	1.5	255 32 7.8	1 44 44.4
2.0	183 7 33.0	4 8 30.4	2.0	227 54 31.6	0 45 28.6	2.0	261 57 58.2	2 17 32.8
2.5	189 3 6.0	3 48 36.0	2.5	234 1 57.9	+0 11 46.1	2.5	268 27 22.6	2 48 51.7
3.0	194 59 0.3	3 26 10.0	3.0	240 11 49.6	−0 22 19.2	3.0	275 0 18.2	3 18 13.5
3.5	200 55 28.2	+3 1 25.3	3.5	246 24 18.0	−0 56 24.1	3.5	281 36 40.3	−3 45 11.0
4.0	206 52 42.9	2 34 36.0	4.0	252 39 34.7	1 30 4.5	4.0	288 16 22.9	4 9 18.5
4.5	212 50 59.0	2 5 57.6	4.5	258 57 52.1	2 2 55.9	4.5	294 59 19.0	4 30 11.6
5.0	218 50 32.3	1 35 46.9	5.0	265 19 22.8	2 34 33.3	5.0	301 45 20.6	4 47 28.3
5.5	224 51 40.4	1 4 21.6	5.5	271 44 20.0	3 4 31.5	5.5	308 34 19.5	5 0 49.1
6.0	230 54 42.9	+0 32 0.3	6.0	278 12 57.2	−3 32 25.3	6.0	315 26 7.0	−5 9 57.9
6.5	237 0 1.5	−0 0 57.4	6.5	284 45 27.9	3 57 50.2	6.5	322 20 34.3	5 14 41.7
7.0	243 8 0.0	0 34 10.9	7.0	291 22 5.3	4 20 21.9	7.0	329 17 32.3	5 14 51.5
7.5	249 19 3.7	1 7 18.8	7.5	298 3 1.4	4 39 37.2	7.5	336 16 51.6	5 10 22.7
8.0	255 33 39.7	1 39 58.6	8.0	304 48 26.7	4 55 14.1	8.0	343 18 22.2	5 1 14.7
8.5	261 52 15.8	−2 11 47.3	8.5	311 38 29.1	−5 6 51.8	8.5	350 21 53.1	−4 47 31.8
9.0	268 15 21.0	2 42 21.0	9.0	318 33 13.0	5 14 12.7	9.0	357 27 12.4	4 29 22.8
9.5	274 43 23.6	3 11 14.8	9.5	325 32 38.6	5 17 1.3	9.5	4 34 5.8	4 7 1.5
10.0	281 16 50.4	3 38 2.8	10.0	332 36 40.8	5 15 5.9	10.0	11 42 17.8	3 40 46.6
10.5	287 56 5.7	4 2 18.6	10.5	339 45 8.5	5 8 18.9	10.5	18 51 30.2	3 11 1.6
11.0	294 41 30.4	−4 23 35.7	11.0	346 57 43.6	−4 56 37.8	11.0	26 1 21.8	−2 38 14.4
11.5	301 33 19.6	4 41 27.7	11.5	354 14 1.2	4 40 6.4	11.5	33 11 28.6	2 2 57.0
12.0	308 31 42.9	4 55 28.6	12.0	1 33 28.9	4 18 54.5	12.0	40 21 24.2	1 25 45.1
12.5	315 36 38.4	5 5 14.2	12.5	8 55 27.2	3 53 18.8	12.5	47 30 39.3	0 47 16.6
13.0	322 47 57.6	5 10 23.1	13.0	16 19 10.5	3 23 43.3	13.0	54 38 42.5	−0 8 11.3
13.5	330 5 19.1	−5 10 37.4	13.5	23 43 47.8	−2 50 38.4	13.5	61 45 1.2	+0 30 50.5
14.0	337 28 10.2	5 5 45.0	14.0	31 8 24.6	2 14 40.4	14.0	68 49 1.9	1 9 9.2
14.5	344 55 46.5	4 55 40.4	14.5	38 32 4.5	1 36 30.4	14.5	75 50 11.9	1 46 7.3
15.0	352 27 12.6	4 40 25.5	15.0	45 53 51.1	0 56 52.9	15.0	82 48 0.1	2 21 10.2
15.5	0 1 23.3	4 20 11.2	15.5	53 12 50.3	−0 16 33.3	15.5	89 41 57.6	2 53 47.2
16.0	7 37 6.5	−3 55 16.8	16.0	60 28 11.9	+0 23 42.9	16.0	96 31 39.5	+3 23 31.9
16.5	15 13 5.8	3 26 10.3	16.5	67 39 11.1	1 3 12.2	16.5	103 16 45.3	3 50 3.1
17.0	22 48 3.6	2 53 27.5	17.0	74 45 10.2	1 41 14.8	17.0	109 56 59.5	4 13 4.4
17.5	30 20 44.7	2 17 49.9	17.5	81 45 39.1	2 17 15.5	17.5	116 32 12.7	4 32 24.5
18.0	37 49 59.2	1 40 2.9	18.0	88 40 16.5	2 50 44.3	18.0	123 2 21.6	4 47 56.2
18.5	45 14 45.3	−1 0 54.1	18.5	95 28 48.8	+3 21 16.6	18.5	129 27 28.6	+4 59 36.7
19.0	52 34 11.2	−0 21 10.3	19.0	102 11 11.0	3 48 33.6	19.0	135 47 42.0	5 7 26.4
19.5	59 47 36.1	+0 18 23.6	19.5	108 47 26.2	4 12 21.4	19.5	142 3 15.7	5 11 28.6
20.0	66 54 30.7	0 57 6.3	20.0	115 17 44.1	4 32 30.7	20.0	148 14 29.1	5 11 49.0
20.5	73 54 37.1	1 34 21.4	20.5	121 42 20.7	4 48 56.5	20.5	154 21 45.9	5 8 34.5
21.0	80 47 48.2	+2 9 37.7	21.0	128 1 37.5	+5 1 36.7	21.0	160 25 33.6	+5 1 53.7
21.5	87 34 6.7	2 42 29.3	21.5	134 16 0.2	5 10 31.9	21.5	166 26 23.4	4 51 56.1
22.0	94 13 43.3	3 12 35.4	22.0	140 25 58.0	5 15 44.8	22.0	172 24 48.9	4 38 51.5
22.5	100 46 55.7	3 39 40.2	22.5	146 32 3.0	5 17 19.8	22.5	178 21 26.1	4 22 50.3
23.0	107 14 7.2	4 3 31.4	23.0	152 34 49.1	5 15 22.3	23.0	184 16 52.5	4 4 3.2
23.5	113 35 45.1	+4 24 0.8	23.5	158 34 51.0	+5 9 58.7	23.5	190 11 46.7	+3 42 41.4
24.0	119 52 19.7	4 41 2.8	24.0	164 32 44.4	5 1 16.0	24.0	196 6 47.0	3 18 56.5
24.5	126 4 23.4	4 54 34.4	24.5	170 29 5.1	4 49 21.8	24.5	202 2 32.5	2 53 0.7
25.0	132 12 29.3	5 4 34.1	25.0	176 24 27.9	4 34 24.3	25.0	207 59 41.0	2 25 6.9
25.5	138 17 11.1	5 11 2.4	25.5	182 19 27.3	4 16 32.5	25.5	213 58 49.2	1 55 29.1
26.0	144 19 1.7	+5 14 1.0	26.0	188 14 36.1	+3 55 56.0	26.0	220 0 32.3	+1 24 22.6
26.5	150 18 33.7	5 13 32.3	26.5	194 10 25.4	3 32 45.4	26.5	226 5 22.4	0 52 4.0
27.0	156 16 17.7	5 9 40.0	27.0	200 7 24.5	3 7 12.5	27.0	232 13 49.4	+0 18 51.9
27.5	162 12 43.2	5 2 28.7	27.5	206 6 0.6	2 39 30.3	27.5	238 26 18.5	−0 14 53.3
28.0	168 8 17.6	4 52 4.0	28.0	212 6 38.1	2 9 53.1	28.0	244 43 11.6	0 48 49.3
28.5	174 3 26.4	4 38 32.5	28.5	218 9 38.7	1 38 37.1	28.5	251 4 45.2	1 22 31.6
29.0	179 58 33.1	+4 22 1.8	29.0	224 15 21.5	+1 6 0.3	29.0	257 31 10.4	−1 55 33.9
29.5	185 53 58.9	4 2 41.0	29.5	230 24 2.7	+0 32 22.3	29.5	264 2 32.6	2 27 28.4
30.0	191 50 3.2	3 40 40.4	30.0	236 35 55.3	−0 1 55.2	30.0	270 38 50.9	2 57 46.0
30.5	197 47 3.3	3 16 11.7	30.5	242 51 9.4	0 36 29.0	30.5	277 19 58.0	3 25 57.2
31.0	203 45 15.3	2 49 28.3	31.0	249 9 52.1	1 10 54.2	31.0	284 5 40.7	3 51 32.6
31.5	209 44 53.5	+2 20 45.0	31.5	255 32 7.8	−1 44 44.4	31.5	290 55 40.1	−4 14 4.0

FOR GREENWICH MEAN NOON.

Date.		THE MOON'S EQUATOR.			☾ Mean Longitude of the Moon.
		i Inclination to Earth's Equator.	Δ Ascend'g Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascend'g Node on Earth's Equator.	
Jan.	0	23° 4′.1	256° 33′.9	356° 22′.9	159° 37′.7
	10	23 3.3	256 1.6	356 23.4	291 23.5
	20	23 2.5	255 29.3	356 23.9	63 9.4
	30	23 1.7	254 57.0	356 24.4	194 55.2
Feb.	9	23 0.9	254 24.8	356 25.0	326 41.0
	19	23 0.1	253 52.6	356 25.6	98 26.9
March	1	22 59.3	253 20.3	356 26.2	230 12.7
	11	22 58.5	252 48.0	356 26.8	1 58.5
	21	22 57.7	252 15.6	356 27.4	133 44.4
	31	22 56.9	251 43.3	356 28.0	265 30.2
April	10	22 56.2	251 10.9	356 28.7	37 16.1
	20	22 55.4	250 38.5	356 29.4	169 1.9
	30	22 54.6	250 6.1	356 30.1	300 47.7
May	10	22 53.9	249 33.7	356 30.9	72 33.6
	20	22 53.1	249 1.3	356 31.6	204 19.4
	30	22 52.4	248 28.8	356 32.4	336 5.2
June	9	22 51.6	247 56.3	356 33.2	107 51.1
	19	22 50.9	247 23.8	356 34.0	239 36.9
	29	22 50.1	246 51.3	356 34.8	11 22.7
July	9	22 49.4	246 18.8	356 35.6	143 8.6
	19	22 48.6	245 46.2	356 36.5	274 54.4
	29	22 47.9	245 13.6	356 37.4	46 40.3
Aug.	8	22 47.2	244 41.0	356 38.3	178 26.1
	18	22 46.4	244 8.4	356 39.2	310 11.9
	28	22 45.7	243 35.8	356 40.1	81 57.8
Sept.	7	22 45.0	243 3.1	356 41.1	213 43.6
	17	22 44.2	242 30.4	356 42.1	345 29.4
	27	22 43.5	241 57.7	356 43.1	117 15.3
Oct.	7	22 42.8	241 25.0	356 44.1	249 1.1
	17	22 42.0	240 52.3	356 45.1	20 46.9
	27	22 41.3	240 19.7	356 46.1	152 32.8
Nov.	6	22 40.6	239 46.9	356 47.2	284 18.6
	16	22 39.9	239 14.1	356 48.3	56 4.5
	26	22 39.2	238 41.3	356 49.4	187 50.3
Dec.	6	22 38.5	238 8.5	356 50.5	319 36.1
	16	22 37.8	237 35.8	356 51.6	91 22.0
	26	22 37.1	237 2.9	356 52.7	223 7.8
	36	22 36.4	236 30.0	356 53.8	354 53.6

Mean Solar Days.	Motion of ☾
0.1	1° 19′.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	
1	0° 32′.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

TABLE FOR THE LIBRATION OF THE MOON.

Argument, (☊ — λ) or (☊ — λ — 180°).

☊ − λ	Δλ	$\frac{1}{a}$	B		☊ − λ	Δλ	$\frac{1}{a}$	B	
0°	0′.0	39	0° 0′.0	180°	46°	0′.6	56	1° 3′.9	134°
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					
	Δλ	$\frac{1}{a}$	B	☊ − λ		Δλ	$\frac{1}{a}$	B	☊ − λ

Δλ has the sign of tan (λ — ☊)
a has the sign of cos (☊ — λ)
B has the sign of sin (☊ — λ)

FOR GREENWICH MEAN NOON.

Date.	Apparent Obliquity of the Ecliptic. (Hansen.)	Equation of Equinoxes		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Par.	
	° ′ ″	″	s	″	″	″	° ′
Jan. 0	23 27 14.46	− 16.05	− 0.982	0.00	− 20.80	9.00	73 14.4
10	14.63	15.61	0.955	1.38	20.79	9.00	72 42.7
20	14.84	15.29	0.935	2.75	20.77	8.99	72 10.9
30	15.09	15.10	0.923	4.13	20.74	8.98	71 39.1
Feb. 9	15.35	15.05	0.920	5.50	20.71	8.96	71 7.3
19	23 27 15.59	− 15.15	− 0.926	6.88	− 20.67	8.94	70 35.6
March 1	15.80	15.37	0.940	8.26	20.63	8.92	70 3.8
11	15.96	15.69	0.960	9.63	20.57	8.90	69 32.0
21	16.05	16.05	0.982	11.01	20.51	8.87	69 0.3
31	16.08	16.40	1.003	12.38	20.45	8.85	68 28.5
April 10	23 27 16.05	− 16.70	− 1.021	13.76	− 20.39	8.82	67 56.7
20	15.98	16.90	1.034	15.14	20.34	8.80	67 24.9
30	15.87	16.98	1.038	16.51	20.29	8.78	66 53.2
May 10	15.75	16.93	1.035	17.89	20.24	8.76	66 21.4
20	15.64	16.74	1.024	19.26	20.19	8.74	65 49.6
30	23 27 15.56	− 16.41	− 1.004	20.64	− 20.16	8.72	65 17.9
June 9	15.53	15.99	0.978	22.02	20.13	8.71	64 46.1
19	15.55	15.52	0.949	23.39	20.11	8.71	64 14.3
29	15.64	15.04	0.920	24.77	20.11	8.70	63 42.5
July 9	15.78	14.60	0.893	26.14	20.10	8.70	63 10.8
19	23 27 15.96	− 14.22	− 0.870	27.52	− 20.12	8.71	62 39.0
29	16.17	13.96	0.854	28.90	20.14	8.72	62 7.2
Aug. 8	16.41	13.82	0.845	30.27	20.17	8.73	61 35.5
18	16.65	13.81	0.845	31.65	20.20	8.75	61 3.7
28	16.87	13.94	0.853	33.02	20.24	8.77	60 31.9
Sept. 7	23 27 17.04	− 14.18	− 0.867	34.40	− 20.29	8.79	60 0.1
17	17.16	14.48	0.886	35.78	20.35	8.81	59 28.4
27	17.23	14.83	0.907	37.15	20.41	8.83	58 56.6
Oct. 7	17.23	15.15	0.926	38.53	20.47	8.86	58 24.8
17	17.17	15.41	0.942	39.90	20.53	8.88	57 53.0
27	23 27 17.07	− 15.56	− 0.951	41.28	− 20.59	8.91	57 21.3
Nov. 6	16.94	15.55	0.951	42.66	20.64	8.93	56 49.5
16	16.82	15 39	0.941	44.03	20.69	8.95	56 17.7
26	16.72	15.10	0.923	45.41	20.73	8.97	55 46.0
Dec. 6	16.65	14.69	0.898	46.78	20.76	8.98	55 14.2
16	23 27 16.64	− 14.19	− 0.868	48.16	− 20.78	8.99	54 42.4
26	16.69	13.65	0.835	49.54	20.79	9.00	54 10.6
36	23 27 16.81	− 13.14	− 0.804	50.91	− 20.79	9.00	53 38.9

Mean Obliquity, 1891.0, 23° 27′ 12″.23 (Hansen).
Mean Obliquity, 1891.0, 23° 27′ 11″.94 (Peters).
Precession for 1891 . . . . 50″.2617 log 1.70124
Precession in a Solar Day . . . . . . 0″.1376 log 9.13863
Precession in a Sidereal Day . . . . . 0″.1372 log 9.13744
Sun's Mean Equatorial Horizontal Parallax . 8″.848 log 0.94685

Daily Motion of ☊
—3′.1773

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF PETERS AND STRUVE.

NOTATION.

τ, the time, reckoned in units of one year, from the beginning of the Besselian fictitious year, (1890, December $30^{\mathrm{d}}.922$ = 1891, January $0^{\mathrm{d}}.0-0^{\mathrm{d}}.078$, Washington mean time),

α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the sun's true longitude,

Ω, the longitude of the moon's ascending node,

ω, the obliquity of the ecliptic,

Γ, the longitude of the sun's perigee,

Γ', the longitude of the moon's perigee,

☾, the moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned}
A = \tau &- 0.34249 \sin \Omega & &- 0.00011 \sin (3\odot - \Gamma) \\
&+ 0.00410 \sin 2\Omega & &- 0.00005 \sin 2(\odot - \Omega) \\
&- 0.02521 \sin 2\odot & &+ 0.00010 \sin 2(\odot - \Gamma') \\
&+ 0.00293 \sin (\odot + 82^\circ\, 4') & &+ 0.00009 \sin (2\Gamma' - \Omega) \\
&+ 0.00025 \sin (2\odot - \Omega) & &+ 0.00005 \cos \Gamma' \\
&- 0.00405 \sin 2\text{☾} & &+ 0.00004 \sin 2\Gamma' \\
&+ 0.00135 \sin (\text{☾} - \Gamma') & &
\end{aligned}$$

$$\begin{aligned}
B = &- 9''.2239 \cos \Omega & &- 0''.0027 \cos (3\odot - \Gamma) \\
&+ 0.0895 \cos 2\Omega & &+ 0.0067 \cos (2\odot - \Omega) \\
&- 0.5506 \cos 2\odot & &+ 0.0024 \cos (2\Gamma' - \Omega) \\
&- 0.0092 \cos (\odot + 281^\circ\, 3') & &- 0.0023 \sin \Gamma' \\
&- 0.0886 \cos 2\text{☾} & &+ 0.0008 \cos 2\Gamma
\end{aligned}$$

$$\begin{aligned}
C &= -\,20''.4451 \cos \omega \cos \odot \\
D &= -\,20.4451 \sin \odot \\
E &= -\,0.0461 \sin \Omega + 0''.0014 \sin 2\Omega - 0''.0033 \sin 2\odot
\end{aligned}$$

Bessel's *Star-Constants.*

$$\begin{aligned}
a &= 3^{\mathrm{s}}.07255 + 1^{\mathrm{s}}.33687 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension} \\
b &= \tfrac{1}{15} \cos \alpha_0 \tan \delta_0 \\
c &= \tfrac{1}{15} \cos \alpha_0 \sec \delta_0 \\
d &= \tfrac{1}{15} \sin \alpha_0 \sec \delta_0 \\
a' &= 20''.0529 \cos \alpha_0 = \text{precession in declination} \\
b' &= -\sin \alpha_0 \\
c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\
d' &= \cos \alpha_0 \sin \delta_0
\end{aligned}$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \tfrac{1}{15} E \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f = 46''.0882\, A + E \ \text{(in arc)} = 3^{\mathrm{s}}.07255\, A + \tfrac{1}{15} E \ \text{(in time)}$$

$$\begin{aligned}
g \sin G &= B & h \sin H &= C & & \\
g \cos G &= 20''.0529\, A & h \cos H &= D & i &= C \tan \omega
\end{aligned}$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + \tau\mu + \tfrac{1}{15}\, g \sin (G + \alpha_0) \tan \delta_0 + \tfrac{1}{15}\, h \sin (H + \alpha_0) \sec \delta_0 \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \qquad \text{(in arc)}$$

Notes.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when Bessel's star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan. 0	−9.4966	−0.3616	−0.5362	+1.3032	Feb. 15	−9.2321	−0.5188	−1.1981	+1.0434
1	9.4944	0.3656	0.5757	1.3017	16	9.2230	0.5178	1.2029	1.0313
2	9.4920	0.3664	0.6119	1.3000	17	9.2126	0.5184	1.2075	1.0187
3	9.4889	0.3643	0.6451	1.2982	18	9.2014	0.5213	1.2120	1.0055
4	9.4847	0.3604	0.6757	1.2963	19	9.1904	0.5266	1.2163	0.9918
5	−9.4793	−0.3562	−0.7043	+1.2942	($10^h.0$) 20	−9.1809	−0.5336	−1.2204	+0.9774
($7^h.0$) 6	9.4725	0.3533	0.7310	1.2921	21	9.1735	0.5415	1.2243	0.9624
7	9.4647	0.3530	0.7559	1.2899	22	9.1686	0.5493	1.2280	0.9468
8	9.4563	0.3562	0.7794	1.2874	23	9.1661	0.5560	1.2316	0.9306
9	9.4479	0.3629	0.8016	1.2846	24	9.1652	0.5607	1.2350	0.9138
10	−9.4399	−0.3725	−0.8225	+1.2815	25	−9.1651	−0.5633	−1.2383	+0.8960
11	9.4332	0.3834	0.8425	1.2783	26	9.1638	0.5636	1.2414	0.8772
12	9.4275	0.3943	0.8615	1.2750	27	9.1609	0.5623	1.2443	0.8574
13	9.4232	0.4037	0.8795	1.2716	28	9.1556	0.5600	1.2471	0.8367
14	9.4196	0.4106	0.8965	1.2682	Mar. 1	9.1473	0.5578	1.2497	0.8150
15	−9.4164	−0.4145	−0.9126	+1.2648	2	−9.1364	−0.5565	−1.2521	+0.7918
16	9.4132	0.4155	0.9281	1.2612	3	9.1235	0.5570	1.2544	0.7671
17	9.4091	0.4142	0.9430	1.2573	4	9.1101	0.5597	1.2566	0.7408
18	9.4037	0.4116	0.9573	1.2531	5	9.0969	0.5643	1.2587	0.7127
19	9.3970	0.4092	0.9710	1.2486	6	9.0854	0.5703	1.2607	0.6826
20	−9.3890	−0.4084	−0.9842	+1.2439	7	−9.0763	−0.5769	−1.2626	+0.6501
($8^h.0$) 21	9.3802	0.4102	0.9969	1.2390	($11^h.0$) 8	9.0701	0.5831	1.2643	0.6148
22	9.3711	0.4151	1.0091	1.2340	9	9.0665	0.5879	1.2658	0.5763
23	9.3626	0.4228	1.0208	1.2289	10	9.0644	0.5908	1.2671	0.5339
24	9.3551	0.4326	1.0319	1.2237	11	9.0622	0.5917	1.2682	0.4868
25	−9.3491	−0.4432	−1.0425	+1.2184	12	−9.0593	−0.5905	−1.2692	+0.4338
26	9.3448	0.4532	1.0528	1.2127	13	9.0542	0.5880	1.2701	0.3731
27	9.3419	0.4615	1.0628	1.2068	14	9.0462	0.5848	1.2709	0.3030
28	9.3398	0.4673	1.0725	1.2007	15	9.0349	0.5819	1.2716	0.2190
29	9.3379	0.4704	1.0819	1.1943	16	9.0210	0.5803	1.2723	0.1145
30	−9.3352	−0.4710	−1.0909	+1.1877	17	−9.0054	−0.5804	−1.2728	+9.9763
31	9.3313	0.4698	1.0996	1.1808	18	8.9894	0.5826	1.2731	9.7718
Feb. 1	9.3255	0.4679	1.1080	1.1737	19	8.9750	0.5866	1.2732	+9.3775
2	9.3179	0.4665	1.1161	1.1664	20	8.9636	0.5916	1.2732	−9.0613
3	9.3087	0.4668	1.1239	1.1589	21	8.9559	0.5969	1.2730	9.6715
4	−9.2984	−0.4696	−1.1313	+1.1511	22	−8.9521	−0.6015	−1.2727	−9.9155
($9^h.0$) 5	9.2878	0.4750	1.1385	1.1430	($12^h.0$) 23	8.9513	0.6046	1.2723	0.0704
6	9.2777	0.4827	1.1455	1.1346	24	8.9519	0.6058	1.2718	0.1843
7	9.2690	0.4918	1.1522	1.1259	25	8.9520	0.6049	1.2712	0.2743
8	9.2620	0.5011	1.1587	1.1168	26	8.9496	0.6023	1.2705	0.3487
9	−9.2570	−0.5095	−1.1650	+1.1074	27	−8.9435	−0.5985	−1.2697	−0.4120
10	9.2534	0.5162	1.1711	1.0975	28	8.9328	0.5945	1.2687	0.4671
11	9.2508	0.5205	1.1769	1.0873	29	8.9172	0.5910	1.2676	0.5158
12	9.2481	0.5224	1.1825	1.0768	30	8.8973	0.5889	1.2662	0.5595
13	9.2445	0.5222	1.1879	1.0660	31	8.8748	0.5888	1.2647	0.5991
14	−9.2393	−0.5207	−1.1931	+1.0550	Apr. 1	−8.8512	−0.5906	−1.2631	−0.6352
15	−9.2321	−0.5188	−1.1981	+1.0434	2	−8.8292	−0.5940	−1.2614	−0.6684

$E = -\,0.''04$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	−8.8512	−0.5906	−1.2631	−0.6352	May 17	+8.6667	−0.5670	−1.0098	−1.2340
2	8.8292	0.5940	1.2614	0.6684	18	8.6763	0.5658	0.9984	1.2387
3	8.8108	0.5982	1.2596	0.6990	19	8.6881	0.5626	0.9865	1.2432
4	8.7976	0.6024	1.2577	0.7276	20	8.7055	0.5576	0.9742	1.2474
5	8.7883	0.6056	1.2557	0.7543	21	8.7287	0.5518	0.9613	1.2515
6	−8.7829	−0.6072	−1.2536	−0.7792	22	+8.7579	−0.5460	−0.9479	−1.2555
(13^{h}.0) 7	8.7787	0.6068	1.2513	0.8027	(16^{h}.0) 23	8.7910	0.5415	0.9340	1.2593
8	8.7729	0.6044	1.2488	0.8248	24	8.8254	0.5388	0.9196	1.2630
9	8.7633	0.6005	1.2461	0.8458	25	8.8582	0.5385	0.9048	1.2666
10	8.7479	0.5956	1.2432	0.8656	26	8.8879	0.5405	0.8892	1.2700
11	−8.7253	−0.5908	−1.2402	−0.8844	27	+8.9130	−0.5440	−0.8728	−1.2733
12	8.6956	0.5869	1.2371	0.9023	28	8.9329	0.5483	0.8556	1.2764
13	8.6598	0.5846	1.2339	0.9194	29	8.9476	0.5523	0.8376	1.2793
14	8.6199	0.5843	1.2305	0.9358	30	8.9596	0.5550	0.8187	1.2820
15	8.5794	0.5859	1.2270	0.9514	31	8.9691	0.5558	0.7987	1.2646
16	−8.5429	−0.5890	−1.2234	−0.9664	June 1	+8.9782	−0.5545	−0.7776	−1.2871
17	8.5139	0.5926	1.2196	0.9807	2	8.9886	0.5511	0.7554	1.2895
18	8.4945	0.5959	1.2156	0.9944	3	9.0010	0.5464	0.7321	1.2918
19	8.4842	0.5981	1.2114	1.0075	4	9.0167	0.5410	0.7074	1.2939
20	8.4795	0.5984	1.2070	1.0200	5	9.0352	0.5362	0.6808	1.2959
21	−8.4742	−0.5967	−1.2024	−1.0321	6	+9.0550	−0.5329	−0.6524	−1.2977
(14^{h}.0) 22	8.4627	0.5930	1.1977	1.0438	(17^{h}.0) 7	9.0750	0.5319	0.6219	1.2994
23	8.4406	0.5880	1.1929	1.0551	8	9.0937	0.5332	0.5890	1.3010
24	8.4016	0.5824	1.1880	1.0660	9	9.1103	0.5366	0.5534	1.3025
25	8.3408	0.5771	1.1829	1.0764	10	9.1239	0.5415	0.5143	1.3038
26	−8.2521	−0.5730	−1.1776	−1.0864	11	+9.1343	−0.5467	−0.4713	−1.3050
27	8.1277	0.5709	1.1720	1.0961	12	9.1419	0.5512	0.4234	1.3061
28	7.9474	0.5709	1.1662	1.1055	13	9.1474	0.5542	0.3693	1.3071
29	7.6599	0.5727	1.1602	1.1146	14	9.1520	0.5552	0.3076	1.3080
30	−6.9731	0.5758	1.1540	1.1234	15	9.1570	0.5540	0.2354	1.3087
May 1	+7.2923	−0.5792	−1.1476	−1.1319	16	+9.1635	−0.5511	−0.1486	−1.3093
2	7.6117	0.5820	1.1410	1.1401	17	9.1722	0.5470	0.0397	1.3098
3	7.7497	0.5833	1.1342	1.1480	18	9.1830	0.5427	9.8942	1.3102
4	7.8395	0.5827	1.1271	1.1556	19	9.1960	0.5393	9.6734	1.3105
5	7.9170	0.5799	1.1198	1.1629	20	9.2104	0.5378	−9.2004	1.3106
6	+8.0021	−0.5754	−1.1123	−1.1699	21	+9.2250	−0.5385	+9.1820	−1.3106
(15^{h}.0) 7	8.0983	0.5697	1.1045	1.1767	(18^{h}.0) 22	9.2390	0.5416	9.6672	1.3105
8	8.2001	0.5637	1.0964	1.1833	23	9.2515	0.5465	9.8904	1.3102
9	8.2987	0.5585	1.0880	1.1898	24	9.2619	0.5524	0.0369	1.3098
10	8.3886	0.5548	1.0793	1.1961	25	9.2702	0.5584	0.1461	1.3093
11	+8.4657	−0.5533	−1.0703	−1.2021	26	+9.2767	−0.5634	+0.2332	−1.3087
12	8.5289	0.5540	1.0610	1.2079	27	9.2821	0.5667	0.3057	1.3080
13	8.5781	0.5565	1.0514	1.2135	28	9.2866	0.5678	0.3676	1.3072
14	8.6140	0.5600	1.0415	1.2189	29	9.2917	0.5671	0.4218	1.3062
15	8.6390	0.5635	1.0314	1.2241	30	9.2979	0.5648	0.4697	1.3051
16	+8.6554	−0.5661	−1.0208	−1.2291	July 1	+9.3055	−0.5616	+0.5128	−1.3039
17	+8.6667	−0.5670	−1.0098	−1.2340	2	+9.3146	−0.5587	+0.5519	−1.3026

E = − 0″.04

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
July 1	+9.3055	−0.5616	+0.5128	−1.3039	Aug. 16	+9.5476	−0.6640	+1.1813	−1.0797
2	9.3146	0.5587	0.5519	1.3026	17	9.5522	0.6696	1.1864	1.0695
3	9.3250	0.5569	0.5877	1.3012	18	9.5558	0.6756	1.1913	1.0591
4	9.3358	0.5571	0.6206	1.2996	19	9.5583	0.6813	1.1961	1.0483
5	9.3464	0.5595	0.6511	1.2979	20	9.5601	0.6859	1.2008	1.0370
6	+9.3559	−0.5640	+0.6794	−1.2960	21	+9.5613	−0.6888	+1.2053	−1.0252
(19ʰ.0) 7	9.3612	0.5701	0.7060	1.2940	(22ʰ.0) 22	9.5624	0.6901	1.2097	1.0128
8	9.3705	0.5767	0.7309	1.2919	23	9.5639	0.6900	1.2140	0.9999
9	9.3752	0.5830	0.7543	1.2897	24	9.5660	0.6888	1.2181	0.9864
10	9.3786	0.5881	0.7765	1.2874	25	9.5690	0.6872	1.2220	0.9723
11	+9.3811	−0.5914	+0.7974	−1.2849	26	+9.5730	−0.6860	+1.2257	−0.9576
12	9.3836	0.5927	0.8173	1.2823	27	9.5775	0.6857	1.2292	0.9422
13	9.3867	0.5921	0.8361	1.2795	28	9.5822	0.6870	1.2324	0.9262
14	9.3910	0.5903	0.8540	1.2766	29	9.5867	0.6898	1.2355	0.9099
15	9.3967	0.5880	0.8711	1.2736	30	9.5906	0.6941	1.2385	0.8932
16	+9.4038	−0.5863	+0.8875	−1.2704	31	+9.5937	−0.6991	+1.2415	−0.8752
17	9.4119	0.5859	0.9032	1.2670	Sept. 1	9.5957	0.7043	1.2444	0.8562
18	9.4207	0.5876	0.9183	1.2635	2	9.5968	0.7089	1.2472	0.8362
19	9.4291	0.5913	0.9327	1.2598	3	9.5971	0.7123	1.2498	0.8150
20	9.4369	0.5968	0.9465	1.2560	4	9.5973	0.7142	1.2522	0.7926
21	+9.4437	−0.6034	+0.9598	−1.2521	5	+9.5975	−0.7144	+1.2545	−0.7687
22	9.4488	0.6102	0.9726	1.2480	(23ʰ.0) 6	9.5981	0.7134	1.2566	0.7434
(20ʰ.0) 23	9.4528	0.6163	0.9849	1.2437	7	9.5996	0.7115	1.2586	0.7164
24	9.4557	0.6211	0.9967	1.2393	8	9.6021	0.7095	1.2604	0.6874
25	9.4583	0.6240	1.0081	1.2347	9	9.6054	0.7080	1.2621	0.6562
26	+9.4609	−0.6250	+1.0191	−1.2299	10	+9.6094	−0.7077	+1.2637	−0.6224
27	9.4640	0.6245	1.0297	1.2249	11	9.6134	0.7088	1.2652	0.5655
28	9.4682	0.6231	1.0399	1.2198	12	9.6176	0.7114	1.2666	0.5451
29	9.4735	0.6216	1.0498	1.2145	13	9.6211	0.7151	1.2678	0.5005
30	9.4796	0.6207	1.0594	1.2090	14	9.6238	0.7194	1.2689	0.4504
31	+9.4863	−0.6214	+1.0667	−1.2033	15	+9.6258	−0.7236	+1.2699	−0.3937
Aug. 1	9.4931	0.6239	1.0777	1.1974	16	9.6270	0.7271	1.2708	0.3283
2	9.4994	0.6282	1.0864	1.1913	17	9.6277	0.7293	1.2715	0.2510
3	9.5049	0.6340	1.0948	1.1849	18	9.6282	0.7299	1.2721	0.1568
4	9.5091	0.6405	1.1029	1.1783	19	9.6289	0.7291	1.2725	0.0360
5	+9.5121	−0.6468	+1.1107	−1.1715	20	+9.6302	−0.7271	+1.2728	−9.8678
6	9.5139	0.6523	1.1182	1.1645	(0ʰ.0) 21	9.6322	0.7245	1.2730	9.5910
(21ʰ.0) 7	9.5149	0.6564	1.1254	1.1573	22	9.6350	0.7219	1.2731	−8.6075
8	9.5159	0.6587	1.1322	1.1500	23	9.6385	0.7201	1.2730	+9.4894
9	9.5172	0.6593	1.1388	1.1423	24	9.6423	0.7195	1.2728	9.8187
10	+9.5191	−0.6585	+1.1453	−1.1343	25	+9.6461	−0.7203	+1.2725	+0.0038
11	9.5220	0.6571	1.1517	1.1260	26	9.6494	0.7227	1.2721	0.1330
12	9.5262	0.6559	1.1580	1.1174	27	9.6522	0.7259	1.2716	0.2323
13	9.5312	0.6556	1.1642	1.1085	28	9.6541	0.7294	1.2710	0.3132
14	9.5368	0.6568	1.1702	1.0992	29	9.6551	0.7327	1.2702	0.3812
15	+9.5425	−0.6596	+1.1759	−1.0896	30	+9.6555	−0.7350	+1.2692	+0.4398
16	+9.5476	−0.6640	+1.1813	−1.0797	Oct. 1	+9.6555	−0.7359	+1.2681	+0.4916

E = − 0.″04

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct. 1	+9.6555	−0.7359	+1.2681	+0.4916	Nov. 16	+9.7551	−0.6910	+1.0360	+1.2218
2	9.6554	0.7353	1.2668	0.5376	17	9.7589	0.6879	1.0251	1.2271
3	9.6558	0.7334	1.2654	0.5792	18	9.7628	0.6864	1.0137	1.2322
4	9.6568	0.7304	1.2639	0.6170	19	9.7665	0.6864	1.0018	1.2371
5	9.6587	0.7271	1.2623	0.6517	20	9.7699	0.6879	0.9894	1.2419
6	+9.6614	−0.7240	+1.2606	+0.6837	(4^{h}.0) 21	+9.7727	−0.6904	+0.9766	+1.2466
(1^{h}.0) 7	9.6647	0.7219	1.2587	0.7134	22	9.7749	0.6931	0.9633	1.2511
8	9.6684	0.7211	1.2567	0.7411	23	9.7766	0.6952	0.9493	1.2554
9	9.6721	0.7218	1.2545	0.7671	24	9.7777	0.6963	0.9347	1.2594
10	9.6755	0.7237	1.2522	0.7915	25	9.7787	0.6958	0.9195	1.2632
11	+9.6782	−0.7264	+1.2498	+0.8144	26	+9.7797	−0.6938	+0.9037	+1.2668
12	9.6803	0.7293	1.2472	0.8360	27	9.7811	0.6905	0.8873	1.2703
13	9.6817	0.7317	1.2444	0.8566	28	9.7832	0.6863	0.8699	1.2736
14	9.6826	0.7329	1.2415	0.8762	29	9.7858	0.6821	0.8515	1.2768
15	9.6833	0.7327	1.2385	0.8948	30	9.7892	0.6786	0.8321	1.2799
16	+9.6842	−0.7310	+1.2353	+0.9124	Dec. 1	+9.7927	−0.6764	+0.8117	+1.2829
17	9.6853	0.7280	1.2320	0.9292	2	9.7965	0.6758	0.7902	1.2857
18	9.6872	0.7243	1.2285	0.9452	3	9.8003	0.6769	0.7674	1.2883
19	9 6898	0.7205	1.2248	0.9606	4	9.8036	0.6794	0.7433	1.2907
20	9.6930	0.7171	1.2209	0.9754	5	9.8065	0.6827	0.7176	1.2930
21	+9.6967	−0.7146	+1.2169	+0.9897	6	+9.8089	−0.6859	+0.6901	+1.2952
(2^{h}.0) 22	9.7005	0.7137	1.2127	1.0034	(5^{h}.0) 7	9.8107	0.6884	0.6607	1.2972
23	9.7040	0.7144	1.2083	1.0165	8	9.8123	0.6896	0.6287	1.2991
24	9.7070	0.7162	1.2037	1.0291	9	9.8138	0.6892	0.5943	1.3008
25	9.7094	0.7186	1.1990	1.0412	10	9.8155	0.6873	0.5567	1.3024
26	+9.7110	−0.7210	+1.1941	+1.0528	11	+9.8175	−0.6843	+0.5154	+1.3038
27	9.7119	0.7226	1.1890	1.0640	12	9.8201	0.6807	0.4695	1.3051
28	9.7124	0.7230	1.1837	1.0748	13	9.8231	0.6772	0.4181	1.3062
29	9.7129	0.7218	1.1782	1.0852	14	9.8265	0.6749	0.3595	1.3072
30	9.7136	0.7192	1.1725	1.0953	15	9.8302	0.6740	0.2916	1.3081
31	+9.7147	−0.7155	+1.1666	+1.1050	16	+9.8339	−0.6748	+0.2110	+1.3089
Nov. 1	9.7166	0.7111	1.1604	1.1143	17	9.8372	0.6772	0.1116	1.3095
2	9.7192	0.7068	1.1540	1.1233	18	9.8402	0.6808	9.9824	1.3100
3	9.7225	0.7033	1.1474	1.1320	19	9.8425	0.6850	9.7973	1.3104
4	9.7263	0.7012	1.1405	1.1404	20	9.8443	0.6888	+9.4700	1.3106
5	+9.7302	−0.7006	+1.1334	+1.1486	21	+9.8457	−0.6917	−8.5977	+1.3106
(3^{h}.0) 6	9.7338	0.7015	1.1261	1.1565	(6^{h}.0) 22	9.8467	0.6931	9.5717	1.3105
7	9.7370	0.7034	1.1185	1.1641	23	9.8478	0.6930	9.8490	1.3103
8	9.7396	0.7058	1.1106	1.1714	24	9.8492	0.6915	0.0169	1.3099
9	9.7416	0.7079	1.1024	1.1785	25	9.8509	0.6891	0.1376	1.3094
10	+9.7430	−0.7091	+1.0939	+1.1854	26	+9.8531	−0.6864	−0.2317	+1.3088
11	9.7443	0.7089	1.0851	1.1920	27	9.8559	0.6842	0.3090	1.3080
12	9.7456	0.7071	1.0760	1.1984	28	9.8590	0.6832	0.3745	1.3071
13	9.7471	0.7039	1.0666	1.2046	29	9.8624	0.6836	0.4313	1.3061
14	9.7492	0.6997	1.0568	1.2106	30	9.8657	0.6858	0.4813	1.3049
15	+9.7519	−0.6952	+1.0466	+1.2163	31	+9.8688	−0.6895	−0.5261	+1.3035
16	+9.7551	−0.6910	+1.0360	+1.2218	32	+9.8715	−0.6941	−0.5665	+1.3020

E = — 0″.04

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Jan. 0	0.0016	−14.50	−0.967	200 4	13 20.3	350 18	23 21.2	+0.8260	+1.3094	−1.49	−0.1732
1	0.0043	14.43	0.962	200 20	13 21.3	349 22	23 17.5	0.8245	1.3092	1.64	0.2128
2	0.0071	14.35	0.957	200 29	13 21.9	348 26	23 13.7	0.8226	1.3090	1.78	0.2491
3	0.0098	14.25	0.950	200 31	13 22.1	347 29	23 9.9	0.8196	1.3087	1.92	0.2822
4	0.0126	14.11	0.941	200 32	13 22.1	346 32	23 6.1	0.8154	1.3084	2.06	0.3129
5	0.0153	−13.94	−0.929	200 35	13 22.3	345 35	23 2.3	+0.8101	+1.3081	−2.20	−0.3416
($7^{h}.0$) 6	0.0180	13.72	0.915	200 45	13 23.0	344 38	22 58.5	0.8038	1.3078	2.34	0.3682
7	0.0208	13.48	0.899	201 5	13 24.3	343 41	22 54.7	0.7970	1.3074	2.48	0.3933
8	0.0235	13.22	0.881	201 36	13 26.4	342 44	22 50.9	0.7901	1.3070	2.62	0.4167
9	0.0263	12.97	0.865	202 18	13 29.2	341 47	22 47.1	0.7839	1.3066	2.75	0.4389
10	0.0290	−12.73	−0.849	203 7	13 32.5	340 50	22 43.3	+0.7785	+1.3062	−2.88	−0.4599
11	0.0317	12.53	0.835	203 58	13 35.9	339 53	22 39.5	0.7746	1.3058	3.02	0.4799
12	0.0345	12.37	0.825	204 48	13 39.2	338 56	22 35.7	0.7717	1.3054	3.16	0.4989
13	0.0372	12.25	0.817	205 29	13 41.9	337 58	22 31.9	0.7699	1.3049	3.29	0.5169
14	0.0400	12.15	0.810	206 2	13 44.1	337 1	22 28.1	0.7683	1.3044	3.42	0.5339
15	0.0427	−12.05	−0.803	206 25	13 45.7	336 3	22 24.2	+0.7662	+1.3039	−3.55	−0.5499
16	0.0454	11.97	0.798	206 37	13 46.5	335 5	22 20.3	0.7641	1.3034	3.68	0.5653
17	0.0482	11.86	0.791	206 46	13 47.1	334 7	22 16.5	0.7605	1.3029	3.81	0.5801
18	0.0509	11.72	0.781	206 55	13 47.7	333 9	22 12.6	0.7557	1.3024	3.94	0.5944
19	0.0537	11.53	0.769	207 9	13 48.6	332 11	22 8.7	0.7499	1.3019	4.07	0.6083
20	0.0564	−11.33	−0.755	207 32	13 50.1	331 12	22 4.8	+0.7434	+1.3013	−4.19	−0.6216
($8^{h}.0$) 21	0.0591	11.10	0.740	208 7	13 52.5	330 14	22 0.9	0.7369	1.3007	4.31	0.6343
22	0.0618	10.87	0.725	208 53	13 55.5	329 15	21 57.0	0.7310	1.3001	4.43	0.6465
23	0.0646	10.66	0.711	209 48	13 59.2	328 16	21 53.1	0.7264	1.2995	4.55	0.6582
24	0.0673	10.48	0.699	210 48	14 3.2	327 17	21 49.1	0.7233	1.2989	4.67	0.6694
25	0.0700	−10.34	−0.689	211 46	14 7.1	326 18	21 45.2	+0.7218	+1.2983	−4.79	−0.6800
26	0.0727	10.25	0.683	212 37	14 10.5	325 18	21 41.2	0.7215	1.2977	4.91	0.6903
27	0.0755	10.17	0.678	213 18	14 13.2	324 19	21 37.3	0.7220	1.2971	5.02	0.7003
28	0.0782	10.12	0.675	213 47	14 15.1	323 19	21 33.3	0.7223	1.2965	5.13	0.7100
29	0.0810	10.07	0.671	214 5	14 16.3	322 20	21 29.3	0.7220	1.2959	5.24	0.7194
30	0.0837	−10.02	−0.668	214 17	14 17.1	321 20	21 25.3	+0.7203	+1.2952	−5.35	−0.7284
31	0.0864	9.93	0.662	214 27	14 17.8	320 20	21 21.3	0.7172	1.2946	5.46	0.7371
Feb. 1	0.0892	9.79	0.653	214 41	14 18.7	319 19	21 17.3	0.7127	1.2939	5.56	0.7455
2	0.0919	9.62	0.641	215 4	14 20.3	318 19	21 13.3	0.7071	1.2933	5.67	0.7536
3	0.0947	9.42	0.628	215 40	14 22.7	317 18	21 9.2	0.7011	1.2926	5.77	0.7613
4	0.0974	− 9.20	−0.613	216 29	14 25.9	316 18	21 5.2	+0.6953	+1.2919	−5.87	−0.7687
($9^{h}.0$) 5	0.1001	8.98	0.599	217 30	14 30.0	315 17	21 1.1	0.6905	1.2912	5.97	0.7759
6	0.1029	8.78	0.585	218 38	14 34.5	314 16	20 57.1	0.6872	1.2906	6.07	0.7829
7	0.1056	8.59	0.573	219 47	14 39.1	313 15	20 53.0	0.6856	1.2899	6.17	0.7897
8	0.1084	8.47	0.565	220 51	14 43.4	312 14	20 48.9	0.6854	1.2893	6.26	0.7962
9	0.1111	− 8.37	−0.558	221 44	14 46.9	311 13	20 44.8	+0.6863	+1.2886	−6.35	−0.8025
10	0.1138	8.30	0.553	222 24	14 49.6	310 11	20 40.7	0.6873	1.2879	6.44	0.8086
11	0.1166	8.25	0.550	222 51	14 51.4	309 9	20 36.6	0.6879	1.2873	6.53	0.8144
12	0.1193	8.20	0.547	223 10	14 52.7	308 7	20 32.5	0.6874	1.2866	6.61	0.8200
13	0.1221	8.13	0.542	223 23	14 53.5	307 5	20 28.3	0.6853	1.2860	6.69	0.8254
14	0.1248	− 8.04	−0.536	223 38	14 54.5	306 3	20 24.2	+0.6819	+1.2853	−6.77	−0.8306
15	0.1275	− 7.91	−0.527	223 59	14 55.9	305 0	20 20.0	+0.6772	+1.2847	−6.85	−0.8356

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1275	−7.91	−0.527	223 59	14 55.9	305 0	20 20.0	+0.6772	+1.2847	−6.85	−0.8356
16	0.1303	7.74	0.516	224 31	14 58.1	303 57	20 15.8	0.6721	1.2841	6.93	0.8404
17	0.1330	7.56	0.504	225 14	15 0.9	302 54	20 11.6	0.6672	1.2835	7.00	0.8450
18	0.1358	7.37	0.491	226 10	15 4.7	301 51	20 7.4	0.6631	1.2829	7.07	0.8494
19	0.1385	7.19	0.479	227 15	15 9.0	300 48	20 3.2	0.6607	1.2823	7.14	0.8537
(10^{h}.0) 20	0.1412	−7.03	−0.469	228 20	15 13.3	299 45	19 59.0	+0.6603	+1.2817	−7.21	−0.8577
21	0.1440	6.91	0.461	229 20	15 17.3	298 42	19 54.8	0.6615	1.2811	7.28	0.8616
22	0.1467	6.83	0.455	230 9	15 20.6	297 39	19 50.6	0.6641	1.2806	7.34	0.8654
23	0.1495	6.80	0.453	230 45	15 23.0	296 35	19 46.3	0.6670	1.2801	7.40	0.8690
24	0.1522	6.78	0.452	231 6	15 24.4	295 31	19 42.1	0.6696	1.2796	7.46	0.8725
25	0.1549	−6.78	−0.452	231 17	15 25.1	294 27	19 37.8	+0.6711	+1.2791	−7.51	−0.8758
26	0.1577	6.76	0.451	231 23	15 25.5	293 23	19 33.5	0.6708	1.2786	7.56	0.8789
27	0.1604	6.72	0.448	231 29	15 25.9	292 19	19 29.3	0.6689	1.2781	7.61	0.8818
28	0.1632	6.63	0.442	231 41	15 26.7	291 15	19 25.0	0.6654	1.2777	7.66	0.8846
Mar. 1	0.1659	6.51	0.434	232 4	15 28.3	290 11	19 20.7	0.6609	1.2773	7.71	0.8872
2	0.1686	−6.35	−0.423	232 41	15 30.7	289 7	19 16.5	+0.6560	+1.2769	−7.75	−0.8896
3	0.1714	6.16	0.411	283 32	15 34.1	288 3	19 12.2	0.6516	1.2765	7.79	0.8919
4	0.1741	5.98	0.399	234 33	15 38.2	286 58	19 7.9	0.6487	1.2761	7.83	0.8941
5	0.1769	5.80	0.387	235 39	15 42.6	285 53	19 3.5	0.6475	1.2757	7.87	0.8962
6	0.1796	5.65	0.377	236 43	15 46.9	284 48	18 59.2	0.6481	1.2754	7.91	0.8982
7	0.1823	−5.53	−0.369	237 39	15 50.6	283 44	18 54.9	+0.6501	+1.2751	−7.94	−0.9001
(11^{h}.0) 8	0.1850	5.46	0.364	238 23	15 53.5	282 39	18 50.6	0.6529	1.2748	7.97	0.9018
9	0.1878	5.41	0.361	238 53	15 55.5	281 34	18 46.3	0.6554	1.2745	8.00	0.9033
10	0.1905	5.39	0.359	239 11	15 56.7	280 20	18 41.9	0.6569	1.2742	8.03	0.9046
11	0.1932	5.36	0.357	239 21	15 57.4	279 24	18 37.6	0.6571	1.2740	8.05	0.9056
12	0.1959	−5.32	−0.355	239 27	15 57.8	278 19	18 33.3	+0.6554	+1.2738	−8.07	−0.9066
13	0.1987	5.26	0.351	239 36	15 58.4	277 14	18 28.9	0.6522	1.2736	8.09	0.9075
14	0.2014	5.15	0.343	239 53	15 59.5	276 9	18 24.6	0.6478	1.2735	8.10	0.9083
15	0.2042	5.03	0.335	240 21	16 1.4	275 4	18 20.3	0.6428	1.2734	8.11	0.9090
16	0.2069	4.88	0.325	241 3	16 4.2	273 58	18 15.9	0.6383	1.2733	8.12	0.9097
17	0.2096	−4.71	−0.314	241 55	16 7.7	272 53	18 11.5	+0.6348	+1.2733	−8.13	−0.9102
18	0.2124	4.54	0.303	242 54	16 11.6	271 48	18 7.2	0.6331	1.2733	8.13	0.9105
19	0.2151	4.39	0.293	243 52	16 15.5	270 43	18 2.9	0.6334	1.2732	8.14	0.9107
20	0.2179	4.28	0.285	244 43	16 18.9	269 38	17 58.5	0.6353	1.2732	8.14	0.9107
21	0.2206	4.20	0.280	245 23	16 21.5	268 33	17 54.2	0.6383	1.2732	8.14	0.9105
22	0.2233	−4.18	−0.279	245 48	16 23.2	267 28	17 49.9	+0.6414	+1.2733	−8.13	−0.9102
(12^{h}.0) 23	0.2261	4.16	0.277	245 59	16 23.9	266 23	17 45.5	0.6439	1.2733	8.12	0.9098
24	0.2288	4.17	0.278	246 1	16 24.1	265 19	17 41.3	0.6451	1.2734	8.11	0.9093
25	0.2316	4.17	0.278	245 58	16 23.9	264 14	17 36.9	0.6443	1.2735	8.10	0.9087
26	0.2343	4.14	0.276	245 57	16 23.8	263 10	17 32.7	0.6417	1.2736	8.09	0.9079
27	0.2370	−4.09	−0.273	246 4	16 24.3	262 5	17 28.3	+0.6375	+1.2738	−8.07	−0.9070
28	0.2398	3.99	0.266	246 24	16 25.6	261 1	17 24.1	0.6324	1.2740	8.05	0.9060
29	0.2425	3.85	0.257	246 59	16 27.9	259 57	17 19.8	0.6271	1.2742	8.03	0.9049
30	0.2453	3.68	0.245	247 48	16 31.2	258 53	17 15.5	0.6223	1.2744	8.01	0.9036
31	0.2480	3.49	0.233	248 49	16 35.3	257 49	17 11.3	0.6192	1.2747	7.98	0.9022
Apr. 1	0.2507	−3.31	−0.221	249 56	16 39.7	256 45	17 7.0	+0.6178	+1.2750	−7.95	−0.9006
2	0.2535	−3.15	−0.210	250 59	16 43.9	255 41	17 2.7	+0.6184	+1.2753	−7.92	−0.8989

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2507	−3.31	−0.221	249 56	16 39.7	256 45	17 7.0	+0.6178	+1.2750	−7.95	−0.9006
2	0.2535	3.15	0.210	250 59	16 43.9	255 41	17 2.7	0.6184	1.2753	7.92	0.8989
3	0.2562	3.02	0.201	251 53	16 47.5	254 37	16 58.5	0.6203	1.2756	7.89	0.8971
4	0.2590	2.93	0.195	252 33	16 50.2	253 33	16 54.2	0.6229	1.2759	7.86	0.8952
5	0.2617	2.87	0.191	253 1	16 52.1	252 30	16 50.0	0.6250	1.2762	7.82	0.8932
6	0.2644	−2.84	−0.189	253 16	16 53.1	251 27	16 45.8	+0.6260	+1.2766	−7.78	−0.8910
($13^{h}.0$) 7	0.2672	2.81	0.187	253 25	16 53.7	250 24	16 41.6	0.6253	1.2770	7.74	0.8887
8	0.2699	2.77	0.185	253 32	16 54.1	249 21	16 37.4	0.6226	1.2774	7.70	0.8862
9	0.2727	2.71	0.181	253 44	16 54.9	248 18	16 33.2	0.6182	1.2778	7.65	0.8836
10	0.2754	2.62	0.175	254 6	16 56.4	247 16	16 29.1	0.6125	1.2783	7.60	0.8808
11	0.2781	−2.49	−0.166	254 43	16 58.9	246 13	16 24.9	+0.6064	+1.2788	−7.55	−0.8779
12	0.2809	2.33	0.155	255 33	17 2.2	245 11	16 20.7	0.6009	1.2793	7.50	0.8748
13	0.2836	2.14	0.143	256 35	17 6.3	244 8	16 16.5	0.5966	1.2798	7.44	0.8716
14	0.2864	1.96	0.131	257 43	17 10.9	243 6	16 12.4	0.5944	1.2803	7.38	0.8682
15	0.2891	1.79	0.119	258 50	17 15.3	242 4	16 8.3	0.5942	1.2808	7.32	0.8646
16	0.2918	−1.65	−0.110	259 47	17 19.1	241 2	16 4.1	+0.5959	+1.2813	−7.26	−0.8609
17	0.2946	1.54	0.103	260 30	17 22.0	240 1	16 0.1	0.5986	1.2818	7.20	0.8570
18	0.2973	1.48	0.099	260 59	17 23.9	239 0	15 56.0	0.6013	1.2824	7.13	0.8530
19	0.3001	1.44	0.096	261 14	17 24.9	237 59	15 51.9	0.6032	1.2830	7.06	0.8488
20	0.3028	1.43	0.095	261 20	17 25.3	236 58	15 47.9	0.6034	1.2836	6.99	0.8445
21	0.3055	−1.41	−0.094	261 24	17 25.6	235 58	15 43.9	+0.6016	+1.2842	−6.92	−0.8400
($14^{h}.0$) 22	0.3083	1.38	0.092	261 33	17 26.2	234 58	15 39.9	0.5977	1.2848	6.85	0.8353
23	0.3110	1.31	0.087	261 52	17 27.5	233 57	15 35.8	0.5924	1.2854	6.77	0.8304
24	0.3138	1.20	0.080	262 28	17 29.9	232 57	15 31.8	0.5862	1.2860	6.69	0.8254
25	0.3165	1.05	0.070	263 22	17 33.5	231 57	15 27.8	0.5800	1.2866	6.61	0.8203
26	0.3192	−0.86	−0.057	264 32	17 38.1	230 58	15 23.9	+0.5750	+1.2872	−6.53	−0.8150
27	0.3219	0.66	0.044	265 52	17 43.5	229 58	15 19.9	0.5720	1.2878	6.45	0.8094
28	0.3247	0.45	0.030	267 16	17 49.1	228 59	15 15.9	0.5718	1.2884	6.37	0.8036
29	0.3274	0.25	0.017	268 36	17 54.4	228 0	15 12.0	0.5731	1.2890	6.28	0.7976
30	0.3301	−0.08	−0.005	269 43	17 58.9	227 1	15 8.1	0.5759	1.2897	6.19	0.7914
May 1	0.3328	+0.05	+0.003	270 36	18 2.4	226 2	15 4.1	+0.5792	+1.2903	−6.10	−0.7850
2	0.3356	0.15	0.010	271 14	18 4.9	225 3	15 0.2	0.5821	1.2910	6.01	0.7784
3	0.3383	0.22	0.015	271 41	18 6.7	224 5	14 56.3	0.5834	1.2916	5.92	0.7716
4	0.3411	0.28	0.019	272 4	18 8.3	223 7	14 52.5	0.5830	1.2923	5.82	0.7645
5	0.3438	0.34	0.023	272 30	18 10.0	222 9	14 48.6	0.5803	1.2929	5.72	0.7572
6	0.3465	+0.42	+0.028	273 4	18 12.3	221 11	14 44.7	+0.5760	+1.2935	−5.62	−0.7497
($15^{h}.0$) 7	0.3493	0.54	0.036	273 53	18 15.5	220 13	14 40.9	0.5707	1.2942	5.52	0.7419
8	0.3520	0.69	0.046	274 58	18 19.9	219 16	14 37.1	0.5653	1.2948	5.42	0.7338
9	0.3548	0.88	0.059	276 18	18 25.2	218 19	14 33.3	0.5611	1.2954	5.32	0.7254
10	0.3575	1.09	0.073	277 47	18 31.1	217 22	14 29.5	0.5588	1.2960	5.21	0.7167
11	0.3602	+1.31	+0.087	279 19	18 37.3	216 25	14 25.7	+0.5591	+1.2966	−5.10	−0.7077
12	0.3630	1.52	0.101	280 43	18 42.9	215 29	14 21.9	0.5616	1.2972	4.99	0.6984
13	0.3657	1.70	0.113	281 54	18 47.6	214 33	14 18.2	0.5659	1.2978	4.88	0.6888
14	0.3685	1.85	0.123	282 48	18 51.2	213 37	14 14.5	0.5709	1.2984	4.77	0.6789
15	0.3712	1.97	0.131	283 25	18 53.7	212 41	14 10.7	0.5755	1.2990	4.66	0.6688
16	0.3739	+2.04	+0.136	283 50	18 55.3	211 45	14 7.0	+0.5789	+1.2996	−4.55	−0.6583
17	0.3767	+2.10	+0.140	284 10	18 56.7	210 49	14 3.3	+0.5804	+1.3001	−4.44	−0.6473

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
May 17	0.3767	+2.10	+0.140	284 10	18 56.7	210 49	14 3.3	+0.5804	+1.3001	−4.44	−0.6473
18	0.3794	2.15	0.143	284 30	18 58.0	209 53	13 59.6	0.5799	1.3007	4.33	0.6358
19	0.3822	2.21	0.147	284 59	18 59.9	208 58	13 55.9	0.5776	1.3012	4.21	0.6239
20	0.3849	2.30	0.153	285 45	19 3.0	208 3	13 52.2	0.5742	1.3017	4.09	0.6115
21	0.3876	2.43	0.162	286 46	19 7.1	207 8	13 48.5	0.5707	1.3022	3.97	0.5986
22	0.3904	+2.60	+0.173	288 5	19 12.3	206 13	13 44.9	+0.5680	+1.3027	−3.85	−0.5852
($16^{h}.0$) 23	0.3931	2.81	0.187	289 36	19 18.4	205 18	13 41.2	0.5674	1.3032	3.73	0.5713
24	0.3959	3.04	0.203	291 12	19 24.8	204 23	13 37.5	0.5692	1.3037	3.61	0.5569
25	0.3986	3.28	0.219	292 43	19 30.9	203 29	13 33.9	0.5736	1.3042	3.48	0.5421
26	0.4013	3.52	0.235	294 3	19 36.2	202 35	13 30.3	0.5799	1.3046	3.36	0.5267
27	0.4041	+3.73	+0.249	295 8	19 40.5	201 41	13 26.7	+0.5872	+1.3051	−3.24	−0.5104
28	0.4068	3.91	0.261	295 56	19 43.7	200 47	13 23.1	0.5944	1.3055	3.12	0.4932
29	0.4096	4.04	0.269	296 29	19 45.9	199 53	13 19.5	0.6005	1.3059	2.99	0.4750
30	0.4123	4.16	0.277	296 59	19 47.9	198 59	13 15.9	0.6051	1.3063	2.86	0.4559
31	0.4150	4.25	0.283	297 27	19 49.8	198 5	13 12.3	0.6077	1.3067	2.73	0.4361
June 1	0.4178	+4.34	+0.289	298 1	19 52.1	197 12	13 8.8	+0.6086	+1.3071	−2.60	−0.4151
2	0.4205	4.45	0.297	298 46	19 55.1	196 18	13 5.2	0.6083	1.3074	2.47	0.3930
3	0.4233	4.58	0.305	299 44	19 58.9	195 25	13 1.7	0.6077	1.3077	2.34	0.3697
4	0.4260	4.75	0.317	300 57	20 3.8	194 32	12 58.1	0.6077	1.3080	2.21	0.3447
5	0.4287	4.96	0.331	302 19	20 9.3	193 38	12 54.5	0.6093	1.3083	2.08	0.3181
6	0.4315	+5.19	+0.346	303 43	20 14.9	192 45	12 51.0	+0.6129	+1.3086	−1.95	−0.2897
($17^{h}.0$) 7	0.4342	5.44	0.363	305 0	20 20.0	191 52	12 47.5	0.6188	1.3088	1.82	0.2593
8	0.4370	5.68	0.379	306 5	20 24.3	190 59	12 43.9	0.6257	1.3091	1.69	0.2263
9	0.4397	5.90	0.393	306 55	20 27.7	190 6	12 40.4	0.6338	1.3093	1.55	0.1905
10	0.4424	6.09	0.406	307 28	20 29.9	189 13	12 36.9	0.6418	1.3095	1.42	0.1513
11	0.4451	+6.24	+0.416	307 48	20 31.2	188 20	12 33.3	+0.6490	+1.3097	−1.28	−0.1082
12	0.4479	6.35	0.423	308 0	20 32.0	187 27	12 29.8	0.6547	1.3099	1.15	0.0601
13	0.4506	6.43	0.429	308 10	20 32.7	186 34	12 26.3	0.6587	1.3101	1.01	0.0060
14	0.4533	6.50	0.433	308 24	20 33.6	185 42	12 22.8	0.6610	1.3102	0.88	9.9439
15	0.4560	6.58	0.439	308 48	20 35.2	184 49	12 19.3	0.6623	1.3103	0.74	9.8714
16	0.4588	+6.68	+0.445	309 24	20 37.6	183 56	12 15.8	+0.6631	+1.3104	−0.61	−9.7840
17	0.4615	6.81	0.454	310 14	20 40.9	183 4	12 12.3	0.6642	1.3105	0.47	9.6737
18	0.4643	6.98	0.465	311 13	20 44.9	182 12	12 8.8	0.6664	1.3105	0.34	9.5244
19	0.4670	7.20	0.480	312 18	20 49.2	181 20	12 5.3	0.6703	1.3106	0.20	9.2873
20	0.4697	7.44	0.496	313 20	20 53.3	180 28	12 1.8	0.6760	1.3106	−0.07	−8.8401
21	0.4725	+7.70	+0.513	314 15	20 57.0	179 35	11 58.3	+0.6834	+1.3106	+0.07	+8.8215
($18^{h}.0$) 22	0.4752	7.95	0.530	314 58	20 59.9	178 43	11 54.8	0.6919	1.3106	0.20	9.2897
23	0.4780	8.18	0.545	315 28	21 1.9	177 50	11 51.3	0.7007	1.3105	0.34	9.5219
24	0.4807	8.38	0.559	315 46	21 3.1	176 57	11 47.8	0.7089	1.3105	0.47	9.6711
25	0.4834	8.54	0.569	315 55	21 3.7	176 5	11 44.3	0.7161	1.3104	0.60	9.7817
26	0.4862	+8.67	+0.578	316 1	21 4.1	175 12	11 40.8	+0.7219	+1.3103	+0.74	+9.8694
27	0.4889	8.78	0.585	316 9	21 4.6	174 20	11 37.3	0.7262	1.3102	0.87	9.9421
28	0.4917	8.88	0.592	316 23	21 5.5	173 27	11 33.8	0.7291	1.3101	1.01	0.0044
29	0.4944	8.98	0.599	316 46	21 7.1	172 34	11 30.3	0.7314	1.3099	1.14	0.0585
30	0.4971	9.11	0.607	317 19	21 9.3	171 41	11 26.7	0.7337	1.3097	1.27	0.1066
July 1	0.4999	+9.27	+0.618	318 2	21 12.1	170 49	11 23.3	+0.7364	+1.3095	+1.41	+0.1499
2	0.5026	+9.47	+0.631	318 49	21 15.3	169 56	11 19.7	+0.7402	+1.3093	+1.54	+0.1890

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
July 1	0.4999	+ 9.27	+0.618	318 2	21 12.1	170 49	11 23.3	+0.7364	+1.3095	+1.41	+0.1499
2	0.5026	9.47	0.631	318 49	21 15.3	169 56	11 19.7	0.7402	1.3093	1.54	0.1890
3	0.5054	9.70	0.647	319 37	21 18.5	169 4	11 16.3	0.7454	1.3091	1.68	0.2248
4	0.5081	9.95	0.663	320 18	21 21.2	168 11	11 12.7	0.7518	1.3089	1.81	0.2578
5	0.5108	10.19	0.679	320 50	21 23.3	167 18	11 9.2	0.7591	1.3086	1.94	0.2883
6	0.5136	+10.42	+0.695	321 9	21 24.6	166 25	11 5.7	+0.7667	+1.3083	+2.07	+0.3167
($19^{h}.0$) 7	0.5163	10.62	0.708	321 18	21 25.2	165 32	11 2.1	0.7741	1.3080	2.20	0.3433
8	0.5191	10.77	0.718	321 17	21 25.1	164 39	10 58.6	0.7805	1.3077	2.33	0.3682
9	0.5218	10.89	0.726	321 11	21 24.7	163 46	10 55.1	0.7858	1.3074	2.46	0.3916
10	0.5245	10.98	0.732	321 4	21 24.3	162 53	10 51.5	0.7899	1.3071	2.59	0.4138
11	0.5273	+11.05	+0.737	321 1	21 24.0	162 0	10 48.0	+0.7927	+1.3068	+2.72	+0.4347
12	0.5300	11.11	0.741	321 6	21 24.3	161 6	10 44.4	0.7947	1.3064	2.85	0.4546
13	0.5328	11.19	0.746	321 20	21 25.3	160 12	10 40.8	0.7964	1.3060	2.98	0.4735
14	0.5355	11.31	0.754	321 43	21 26.9	159 18	10 37.2	0.7984	1.3056	3.10	0.4914
15	0.5382	11.45	0.763	322 14	21 28.9	158 24	10 33.6	0.8010	1.3052	3.23	0.5085
16	0.5410	+11.64	+0.776	322 48	21 31.2	157 30	10 30.0	+0.8048	+1.3047	+3.35	+0.5249
17	0.5437	11.86	0.791	323 20	21 33.3	156 36	10 26.4	0.8099	1.3042	3.47	0.5406
18	0.5465	12.10	0.807	323 47	21 35.1	155 42	10 22.8	0.8161	1.3038	3.59	0.5556
19	0.5492	12.34	0.823	324 5	21 36.3	154 47	10 19.1	0.8229	1.3033	3.71	0.5700
20	0.5519	12.56	0.837	324 13	21 36.9	153 53	10 15.5	0.8300	1.3028	3.83	0.5838
21	0.5547	+12.76	+0.851	324 15	21 37.0	152 59	10 11.9	+0.8366	+1.3023	+3.95	+0.5971
22	0.5574	12.91	0.861	324 8	21 36.5	152 4	10 8.3	0.8423	1.3018	4.07	0.6099
($20^{h}.0$) 23	0.5602	13.03	0.869	324 0	21 36.0	151 9	10 4.6	0.8470	1.3013	4.19	0.6222
24	0.5629	13.12	0.875	323 53	21 35.5	150 14	10 0.9	0.8506	1.3007	4.30	0.6339
25	0.5656	13.20	0.880	323 52	21 35.5	149 19	9 57.3	0.8533	1.3002	4.42	0.6452
26	0.5684	+13.27	+0.885	323 58	21 35.9	148 23	9 53.5	+0.8553	+1.2996	+4.53	+0.6562
27	0.5711	13.38	0.892	324 11	21 36.7	147 28	9 49.9	0.8572	1.2991	4.65	0.6669
28	0.5739	13.51	0.901	324 32	21 38.1	146 32	9 46.1	0.8595	1.2985	4.76	0.6773
29	0.5766	13.67	0.911	324 57	21 39.8	145 37	9 42.5	0.8626	1.2979	4.87	0.6873
30	0.5793	13.87	0.925	325 23	21 41.5	144 41	9 38.7	0.8664	1.2973	4.98	0.6969
31	0.5820	+14.08	+0.939	325 46	21 43.1	143 45	9 35.0	+0.8711	+1.2967	+5.09	+0.7061
Aug. 1	0.5848	14.30	0.953	326 0	21 44.0	142 49	9 31.3	0.8767	1.2961	5.20	0.7150
2	0.5875	14.51	0.967	326 9	21 44.6	141 53	9 27.5	0.8823	1.2955	5.30	0.7236
3	0.5902	14.70	0.980	326 8	21 44.5	140 56	9 23.7	0.8878	1.2949	5.40	0.7319
4	0.5929	14.84	0.989	325 59	21 43.9	139 59	9 19.9	0.8928	1.2943	5.50	0.7399
5	0.5957	+14.94	+0.996	325 47	21 43.1	139 2	9 16.1	+0.8968	+1.2937	+5.60	+0.7477
6	0.5984	15.01	1.001	325 33	21 42.2	138 5	9 12.3	0.8998	1.2931	5.70	0.7553
($21^{h}.0$) 7	0.6012	15.05	1.003	325 22	21 41.5	137 8	9 8.5	0.9018	1.2925	5.80	0.7626
8	0.6039	15.08	1.005	325 17	21 41.1	136 11	9 4.7	0.9032	1.2918	5.89	0.7697
9	0.6066	15.13	1.009	325 20	21 41.3	135 13	9 0.9	0.9043	1.2912	5.98	0.7765
10	0.6094	+15.19	+1.013	325 30	21 42.0	134 15	8 57.0	+0.9053	+1.2906	+6.07	+0.7831
11	0.6121	15.29	1.019	325 45	21 43.0	133 17	8 53.1	0.9069	1.2900	6.16	0.7895
12	0.6149	15.44	1.029	326 6	21 44.4	132 19	8 49.3	0.9093	1.2894	6.25	0.7957
13	0.6176	15.62	1.041	326 25	21 45.7	131 21	8 45.4	0.9127	1.2887	6.33	0.8017
14	0.6203	15.82	1.055	326 42	21 46.8	130 22	8 41.5	0.9169	1.2881	6.42	0.8075
15	0.6231	+16.03	+1.069	326 51	21 47.4	129 23	8 37.5	+0.9218	+1.2874	+6.50	+0.8131
16	0.6258	+16.23	+1.082	326 54	21 47.6	128 24	8 33.6	+0.9267	+1.2868	+6.58	+0.8185

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	*f*		*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Aug. 16	0.6258	+16.23	+1.082	326 54	21 47.6	128 24	8 33.6	+0.9267	+1.2868	+6.58	+0.8185
17	0.6286	16.40	1.093	326 51	21 47.4	127 25	8 29.7	0.9315	1.2862	6.66	0.8237
18	0.6313	16.54	1.103	326 42	21 46.8	126 26	8 25.7	0.9359	1.2856	6.74	0.8286
19	0.6340	16.63	1.109	326 31	21 46.1	125 26	8 21.7	0.9393	1.2850	6.82	0.8334
20	0.6368	16.70	1.113	326 20	21 45.3	124 26	8 17.7	0.9420	1.2844	6.89	0.8381
21	0.6395	+16.74	+1.116	326 14	21 44.9	123 26	8 13.7	+0.9438	+1.2838	+6.96	+0.8426
(22^{h}.0) 22	0.6423	16.79	1.119	326 13	21 44.9	122 26	8 9.7	0.9449	1.2832	7.03	0.8470
23	0.6450	16.85	1.123	326 19	21 45.3	121 26	8 5.7	0.9459	1.2827	7.10	0.8513
24	0.6477	16.92	1.128	326 31	21 46.1	120 25	8 1.6	0.9470	1.2821	7.17	0.8554
25	0.6505	17.04	1.136	326 47	21 47.1	119 24	7 57.6	0.9487	1.2816	7.23	0.8593
26	0.6532	+17.20	+1.147	327 6	21 48.4	118 23	7 53.5	+0.9511	+1.2810	+7.29	+0.8630
27	0.6560	17.39	1.159	327 24	21 49.6	117 22	7 49.5	0.9542	1.2805	7.35	0.8665
28	0.6587	17.57	1.171	327 36	21 50.4	116 21	7 45.4	0.9579	1.2800	7.41	0.8698
29	0.6614	17.75	1.183	327 42	21 50.8	115 20	7 41.3	0.9619	1.2795	7.47	0.8730
30	0.6642	17.92	1.195	327 40	21 50.7	114 19	7 37.3	0.9660	1.2790	7.52	0.8761
31	0.6669	+18.04	+1.203	327 34	21 50.3	113 17	7 33.1	+0.9695	+1.2786	+7.57	+0.8791
Sept. 1	0.6697	18.13	1.209	327 22	21 49.5	112 15	7 29.0	0.9725	1.2782	7.62	0.8819
2	0.6724	18.18	1.212	327 9	21 48.6	111 13	7 24.9	0.9747	1.2777	7.67	0.8846
3	0.6751	18.19	1.213	326 58	21 47.9	110 11	7 20.7	0.9759	1.2773	7.71	0.8872
4	0.6779	18.20	1.213	326 52	21 47.5	109 9	7 16.6	0.9766	1.2769	7.75	0.8896
5	0.6806	+18.21	+1.214	326 52	21 47.5	108 6	7 12.4	+0.9768	+1.2765	+7.79	+0.8919
(23^{h}.0) 6	0.6834	18.23	1.215	326 58	21 47.9	107 4	7 8.3	0.9769	1.2761	7.83	0.8941
7	0.6861	18.29	1.219	327 10	21 48.7	106 1	7 4.1	0.9774	1.2758	7.87	0.8961
8	0.6888	18.40	1.227	327 26	21 49.7	104 58	6 59.9	0.9786	1.2755	7.90	0.8979
9	0.6916	18.54	1.236	327 44	21 50.9	103 55	6 55.7	0.9804	1.2752	7.93	0.8996
10	0.6943	+18.71	+1.247	327 59	21 51.9	102 52	6 51.5	+0.9832	+1.2749	+7.96	+0.9012
11	0.6971	18.88	1.259	328 9	21 52.6	101 49	6 47.3	0.9865	1.2746	7.99	0.9027
12	0.6998	19.07	1.271	328 15	21 53.0	100 46	6 43.1	0.9902	1.2743	8.02	0.9041
13	0.7025	19.22	1.281	328 14	21 52.9	99 43	6 38.9	0.9938	1.2741	8.04	0.9053
14	0.7053	19.34	1.289	328 8	21 52.5	98 39	6 34.6	0.9969	1.2739	8.06	0.9064
15	0.7080	+19.43	+1.295	328 1	21 52.1	97 35	6 30.3	+0.9995	+1.2737	+8.08	+0.9074
16	0.7108	19.49	1.299	327 52	21 51.5	96 31	6 26.1	1.0014	1.2735	8.10	0.9082
17	0.7135	19.51	1.301	327 47	21 51.1	95 27	6 21.8	1.0025	1.2734	8.11	0.9089
18	0.7162	19.54	1.303	327 47	21 51.1	94 23	6 17.5	1.0030	1.2733	8.12	0.9095
19	0.7189	19.57	1.305	327 52	21 51.5	93 19	6 13.3	1.0033	1.2732	8.12	0.9100
20	0.7217	+19.63	+1.309	328 4	21 52.3	92 15	6 9.0	+1.0037	+1.2732	+8.13	+0.9103
(0^{h}.0) 21	0.7244	19.72	1.315	328 20	21 53.3	91 11	6 4.7	1.0044	1.2731	8.13	0.9105
22	0.7271	19.85	1.323	328 39	21 54.6	90 7	6 0.5	1.0057	1.2731	8.14	0.9106
23	0.7298	20.01	1.334	328 58	21 55.9	89 3	5 56.2	1.0078	1.2731	8.14	0.9105
24	0.7326	20.19	1.346	329 13	21 56.9	87 59	5 51.9	1.0105	1.2732	8.13	0.9103
25	0.7353	+20.36	+1.357	329 24	21 57.6	86 55	5 47.7	+1.0134	+1.2732	+8.13	+0.9100
26	0.7381	20.52	1.368	329 27	21 57.8	85 51	5 43.4	1.0165	1.2733	8.12	0.9096
27	0.7408	20.65	1.377	329 25	21 57.7	84 47	5 39.1	1.0194	1.2734	8.11	0.9091
28	0.7435	20.74	1.383	329 20	21 57.3	83 43	5 34.9	1.0217	1.2735	8.10	0.9085
29	0.7463	20.79	1.386	329 12	21 56.8	82 39	5 30.6	1.0233	1.2737	8.08	0.9077
30	0.7490	+20.80	+1.387	329 5	21 56.3	81 35	5 26.3	+1.0243	+1.2739	+8.06	+0.9068
Oct. 1	0.7518	+20.80	+1.387	329 2	21 56.1	80 31	5 22.1	+1.0245	+1.2741	+8.04	+0.9057

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Oct. 1	0.7518	+20.80	+1.387	329 2	21 56.1	80 31	5 22.1	+1.0245	+1.2741	+8.04	+0.9057
2	0.7545	20.80	1.387	329 4	21 56.2	79 27	5 17.8	1.0242	1.2743	8.02	0.9044
3	0.7572	20.82	1.388	329 12	21 56.8	78 23	5 13.5	1.0240	1.2745	7.99	0.9030
4	0.7600	20.87	1.391	329 26	21 57.7	77 19	5 9.3	1.0240	1.2748	7.96	0.9015
5	0.7627	20.96	1.397	329 44	21 58.9	76 15	5 5.0	1.0245	1.2751	7.93	0.8999
6	0.7655	+21.09	+1.406	330 4	22 0.3	75 11	5 0.7	+1.0258	+1.2754	+7.90	+0.8981
$(1^{h}.0)$ 7	0.7682	21.25	1.417	330 22	22 1.5	74 7	4 56.5	1.0278	1.2757	7.87	0.8962
8	0.7709	21.44	1.429	330 37	22 2.5	73 3	4 52.2	1.0304	1.2761	7.83	0.8941
9	0.7737	21.62	1.441	330 48	22 3.2	71 59	4 47.9	1.0333	1.2765	7.79	0.8919
10	0.7764	21.79	1.453	330 52	22 3.5	70 55	4 43.7	1.0364	1.2769	7.75	0.8896
11	0.7792	+21.93	+1.462	330 52	22 3.5	69 51	4 39.4	+1.0391	+1.2773	+7.71	+0.8872
12	0.7819	22.03	1.469	330 50	22 3.3	68 48	4 35.2	1.0414	1.2777	7.67	0.8847
13	0.7846	22.11	1.474	330 46	22 3.1	67 44	4 30.9	1.0431	1.2781	7.62	0.8820
14	0.7874	22.15	1.477	330 45	22 3.0	66 41	4 26.7	1.0440	1.2786	7.57	0.8791
15	0.7901	22.19	1.479	330 48	22 3.2	65 38	4 22.5	1.0445	1.2791	7.52	0.8760
16	0.7929	+22.23	+1.482	330 57	22 3.8	64 35	4 18.3	+1.0448	+1.2796	+7.46	+0.8728
17	0.7956	22.29	1.486	331 11	22 4.7	63 32	4 14.1	1.0449	1.2801	7.40	0.8694
18	0.7983	22.39	1.493	331 29	22 5.9	62 29	4 9.9	1.0456	1.2806	7.34	0.8658
19	0.8011	22.52	1.501	331 51	22 7.4	61 26	4 5.7	1.0467	1.2812	7.28	0.8621
20	0.8038	22.69	1.513	332 13	22 8.9	60 23	4 1.5	1.0484	1.2817	7.22	0.8582
21	0.8066	+22.88	+1.525	332 32	22 10.1	59 20	3 57.3	+1.0508	+1.2823	+7.15	+0.8542
$(2^{h}.0)$ 22	0.8093	23.09	1.539	332 48	22 11.2	58 18	3 53.2	1.0536	1.2828	7.08	0.8501
23	0.8120	23.27	1.551	332 57	22 11.8	57 16	3 49.1	1.0565	1.2834	7.01	0.8458
24	0.8148	23.43	1.562	333 1	22 12.1	56 14	3 44.9	1.0593	1.2840	6.94	0.8413
25	0.8175	23.56	1.571	333 1	22 12.1	55 12	3 40.8	1.0617	1.2846	6.87	0.8366
26	0.8203	+23.65	+1.577	332 58	22 11.9	54 10	3 36.7	+1.0634	+1.2852	+6.79	+0.8317
27	0.8230	23.70	1.580	332 56	22 11.7	53 8	3 32.5	1.0645	1.2858	6.71	0.8265
28	0.8257	23.73	1.582	332 56	22 11.7	52 6	3 28.4	1.0650	1.2864	6.63	0.8212
29	0.8285	23.76	1.584	333 1	22 12.1	51 5	3 24.3	1.0652	1.2871	6.55	0.8157
30	0.8312	23.79	1.586	333 12	22 12.8	50 4	3 20.3	1.0652	1.2877	6.46	0.8100
31	0.8340	+23.86	+1.591	333 27	22 13.8	49 3	3 16.2	+1.0653	+1.2884	+6.37	+0.8011
Nov. 1	0.8367	23.96	1.597	333 47	22 15.1	48 2	3 12.1	1.0659	1.2891	6.28	0.7979
2	0.8394	24.10	1.607	334 9	22 16.6	47 2	3 8.1	1.0672	1.2898	6.19	0.7915
3	0.8421	24.29	1.619	334 30	22 18.0	46 1	3 4.1	1.0692	1.2904	6.10	0.7848
4	0.8449	24.50	1.633	334 48	22 19.2	45 1	3 0.1	1.0719	1.2911	6.00	0.7779
5	0.8476	+24.72	+1.648	335 1	22 20.1	44 0	2 56.0	+1.0751	+1.2917	+5.90	+0.7708
$(3^{h}.0)$ 6	0.8503	24.93	1.662	335 10	22 20.7	43 0	2 52.0	1.0782	1.2924	5.80	0.7635
7	0.8530	25.12	1.675	335 13	22 20.9	42 0	2 48.0	1.0811	1.2930	5.70	0.7559
8	0.8558	25.27	1.685	335 14	22 20.9	41 0	2 44.0	1.0837	1.2937	5.60	0.7480
9	0.8585	25.39	1.693	335 14	22 20.9	40 1	2 40.1	1.0857	1.2944	5.50	0.7398
10	0.8613	+25.47	+1.698	335 15	22 21.0	39 1	2 36.1	+1.0870	+1.2950	+5.39	+0.7313
11	0.8640	25.54	1.703	335 19	22 21.3	38 1	2 32.1	1.0881	1.2956	5.28	0.7225
12	0.8667	25.61	1.707	335 28	22 21.9	37 2	2 28.1	1.0889	1.2963	5.17	0.7133
13	0.8695	25.70	1.713	335 42	22 22.8	36 2	2 24.1	1.0896	1.2969	5.06	0.7038
14	0.8722	25.83	1.722	336 1	22 24.1	35 3	2 20.2	1.0906	1.2975	4.95	0.6940
15	0.8750	+25.99	+1.733	336 22	22 25.5	34 4	2 16.3	+1.0921	+1.2981	+4.83	+0.6839
16	0.8777	+26.18	+1.745	336 43	22 26.9	33 5	2 12.3	+1.0942	+1.2987	+4.71	+0.6734

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f		G		H		Log g.	Log h.	i	Log i.
		In Arc.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	″	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8777	+26.18	+1.745	336 43	22 26.9	33 5	2 12.3	+1.0942	+1.2987	+4.71	+0.6734
17	0.8804	26.41	1.761	337 3	22 28.2	32 6	2 8.4	1.0969	1.2993	4.59	0.6625
18	0.8832	26.66	1.777	337 18	22 29.2	31 8	2 4.5	1.1000	1.2999	4.47	0.6511
19	0.8859	26.89	1.793	337 29	22 29.9	30 10	2 0.7	1.1031	1.3005	4.35	0.6392
20	0.8887	27.09	1.806	337 34	22 30.3	29 12	1 56.8	1.1063	1.3011	4.23	0.6268
$(4^{h}.0)$ 21	0.8914	+27.27	+1.818	337 35	22 30.3	28 14	1 52.9	+1.1090	+1.3016	+4.11	+0.6140
22	0.8941	27.41	1.827	337 33	22 30.2	27 16	1 49.1	1.1113	1.3022	3.99	0.6008
23	0.8969	27.51	1.834	337 32	22 30.1	26 18	1 45.2	1.1131	1.3027	3.87	0.5869
24	0.8996	27.59	1.839	337 32	22 30.1	25 20	1 41.3	1.1142	1.3032	3.74	0.5723
25	0.9024	27.65	1.843	337 36	22 30.4	24 23	1 37.5	1.1150	1.3037	3.61	0.5570
26	0.9051	+27.71	+1.847	337 45	22 31.0	23 26	1 33.7	+1.1155	+1.3042	+3.48	+0.5411
27	0.9078	27.80	1.853	337 59	22 31.9	22 28	1 29.9	1.1163	1.3047	3.35	0.5245
28	0.9106	27.94	1.863	338 15	22 33.0	21 31	1 26.1	1.1175	1.3052	3.22	0.5071
29	0.9133	28.11	1.874	338 34	22 34.3	20 34	1 22.3	1.1192	1.3056	3.09	0.4888
30	0.9161	28.32	1.888	338 52	22 35.5	19 37	1 18.5	1.1216	1.3060	2.95	0.4695
Dec. 1	0.9188	+28.56	+1.904	339 7	22 36.5	18 40	1 14.7	+1.1244	+1.3064	+2.81	+0.4492
2	0.9215	28.81	1.921	339 19	22 37.3	17 43	1 10.9	1.1276	1.3068	2.68	0.4277
3	0.9243	29.06	1.937	339 26	22 37.7	16 46	1 7.1	1.1311	1.3071	2.54	0.4050
4	0.9270	29.28	1.952	339 28	22 37.9	15 49	1 3.3	1.1344	1.3075	2.40	0.3808
5	0.9298	29.48	1.965	339 27	22 37.8	14 52	0 59.5	1.1373	1.3078	2.26	0.3549
6	0.9325	+29.64	+1.976	339 25	22 37.7	13 56	0 55.7	+1.1397	+1.3082	+2.12	+0.3274
$(5^{h}.0)$ 7	0.9352	29.78	1.985	339 23	22 37.5	12 59	0 51.9	1.1416	1.3085	1.98	0.2979
8	0.9380	29.87	1.991	339 24	22 37.6	12 2	0 48.1	1.1432	1.3088	1.84	0.2660
9	0.9407	29.98	1.999	339 29	22 37.9	11 6	0 44.4	1.1445	1.3091	1.70	0.2315
10	0.9435	30.10	2.007	339 38	22 38.5	10 10	0 40.7	1.1457	1.3094	1.56	0.1939
11	0.9462	+30.24	+2.016	339 51	22 39.4	9 14	0 36.9	+1.1471	+1.3096	+1.42	+0.1524
12	0.9489	30.42	2.028	340 7	22 40.5	8 17	0 33.1	1.1490	1.3098	1.28	0.1065
13	0.9517	30.63	2.042	340 23	22 41.5	7 21	0 29.4	1.1513	1.3100	1.14	0.0549
14	0.9544	30.87	2.058	340 37	22 42.5	6 25	0 25.7	1.1540	1.3101	0.99	9.9961
15	0.9572	31.14	2.076	340 49	22 43.3	5 29	0 21.9	1.1572	1.3102	0.85	9.9279
16	0.9599	+31.41	+2.094	340 56	22 43.7	4 33	0 18.2	+1.1606	+1.3103	+0.70	+9.8468
17	0.9626	31.64	2.109	340 58	22 43.9	3 37	0 14.5	1.1639	1.3104	0.56	9.7465
18	0.9654	31.86	2.124	340 57	22 43.8	2 41	0 10.7	1.1669	1.3105	0.41	9.6150
19	0.9681	32.03	2.135	340 52	22 43.5	1 45	0 7.0	1.1694	1.3105	0.27	9.4221
20	0.9709	32.16	2.144	340 47	22 43.1	0 49	0 3.3	1.1713	1.3106	+0.12	+9.1055
21	0.9736	+32.26	+2.151	340 43	22 42.9	359 53	23 59.5	+1.1728	+1.3106	−0.02	−8.1847
$(6^{h}.0)$ 22	0.9763	32.34	2.156	340 42	22 42.8	358 57	23 55.8	1.1740	1.3106	0.17	9.1889
23	0.9790	32.42	2.161	340 45	22 43.0	358 1	23 52.1	1.1750	1.3105	0.32	9.4803
24	0.9818	32.53	2.169	340 52	22 43.5	357 5	23 48.3	1.1761	1.3105	0.46	9.6513
25	0.9845	32.66	2.177	341 2	22 44.1	356 9	23 44.6	1.1773	1.3104	0.60	9.7732
26	0.9872	+32.82	+2.188	341 14	22 44.9	355 12	23 40.8	+1.1790	+1.3103	−0.74	−9.8680
27	0.9899	33.04	2.203	341 26	22 45.7	354 16	23 37.1	1.1813	1.3102	0.89	9.9455
28	0.9927	33.28	2.219	341 36	22 46.4	353 20	23 33.3	1.1840	1.3100	1.03	0.0112
29	0.9954	33.53	2.235	341 43	22 46.9	352 24	23 29.6	1.1871	1.3099	1.18	0.0682
30	0.9982	33.79	2.253	341 46	22 47.1	351 28	23 25.9	1.1903	1.3097	1.32	0.1183
31	1.0009	+34.03	+2.269	341 44	22 46.9	350 31	23 22.1	+1.1935	+1.3095	−1.46	−0.1631
32	1.0036	+34.25	+2.283	341 40	22 46.7	349 35	23 18.3	+1.1963	+1.3093	−1.60	−0.2036

MEAN PLACES FOR 1891.0. (January $0^d.0$—$0^d.078$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Andromedæ . .	2.1	0 2 45.208	+ 3.0917	+ 28 29 18.96	+ 19.884
* β Cassiopeæ . .	2.4	0 3 21.770	3.1749	+ 58 32 53.66	19.851
* 22 Andromedæ . .	4.9	0 4 39.382	3.1028	+ 45 27 55.73	20.035
4 Draconis (H.) . S. P.	5.1	0 7 5.675	2.8840	+101 46 41.04	20.022
γ Pegasi (*Algenib*) .	2.8	0 7 37.372	3.0839	+ 14 34 39.07	20.023
* σ Andromedæ . .	4.4	0 12 38.042	+ 3.1234	+ 36 10 50.93	+ 19.982
* ι Ceti . . .	3.6	0 13 52.281	3.0528	− 9 25 42.55	19.956
* 6 Ursæ Minoris . S. P.	6.2	0 14 20.556	0.1710	+ 91 41 44.51	19.940
* 44 Piscium . . .	5.8	0 19 48.882	3.0732	+ 1 20 9.63	19.953
β Hydri . . .	2.8	0 20 0.775	3.2289	− 77 52 5.51	20.283
12 Ceti . . .	6.0	0 24 28.550	+ 3.0611	− 4 33 34.53	+ 19.937
κ Draconis . . S. P.	3.8	0 28 49.816	2.5910	+109 36 39.45	19.889
* π Andromedæ . .	4.4	0 31 3.527	3.1910	+ 33 7 9.02	19.870
α Cassiopeæ (*var.*) .	2.3	0 34 19.425	3.3746	+ 55 56 21.82	19.787
β Ceti . . .	2.2	0 38 7.106	3.0142	− 18 35 6.32	19.801
21 Cassiopeæ . .	5.7	0 38 27.080	+ 3.8601	+ 74 23 31.82	+ 19.751
* ο Cassiopeæ . .	4.7	0 38 39.064	3.3198	+ 47 41 15.50	19.754
* δ Piscium . . .	4.8	0 43 1.596	3.1075	+ 6 59 30.26	19.652
32² Camelop. (H.). S. P.	5.2	0 48 19.853	0.3961	+ 95 59 40.83	19.596
* γ Cassiopeæ . .	2.3	0 50 7.860	3.5801	+ 60 7 34.52	19.562
* μ Andromedæ . .	4.0	0 50 42.167	+ 3.3116	+ 37 54 29.11	+ 19.616
* 43 Cephei (H.) . .	4.6	0 53 55.448	7.2565	+ 85 40 19.52	19.500
ε Piscium . . .	4.3	0 57 17.148	3.1092	+ 7 18 11.33	19.453
β Andromedæ . .	2.2	1 3 37.770	3.3447	+ 35 2 32.88	19.163
* κ Tucanæ . . .	4.9	1 12 4.466	2.0549	− 69 27 17.98	19.169
* *f* Piscium . . .	5.1	1 12 10.551	+ 3.0898	+ 3 2 25.13	+ 19.037
θ¹ Ceti . . .	3.6	1 18 34.486	2.9971	− 8 44 45.49	18.666
α Ursæ Minoris (*Polaris*)	2.2	1 18 54.555	23.5100	+ 88 43 37.28	18.876
38 Cassiopeæ . .	5.9	1 23 7.308	4.3800	+ 69 42 11.95	18.673
* ε Octantis . . S. P.	5.4	1 23 24.392	8.7687	− 94 46 23.64	18.741
η Piscium . . .	3.7	1 25 39.027	+ 3.2028	+ 14 47 1.46	+ 18.661
* υ Andromedæ . .	4.2	1 30 24.030	3.5049	+ 40 51 36.71	18.143
* π Piscium . . .	5.5	1 31 19.214	3.1743	+ 11 35 2.15	18.530
α Eridani (*Achernar*) .	0.4	1 33 38.927	2.2322	− 57 47 26.46	18.355
* ν Piscium . . .	4.6	1 35 45.526	3.1180	+ 4 56 8.93	18.327
ο Piscium . . .	4.4	1 39 38.258	+ 3.1624	+ 8 36 31.49	+ 18.214
* ζ Ceti . . .	3.6	1 46 4.809	2.9618	− 10 52 29.12	17.820
β Arietis . . .	2.8	1 48 37.093	3.3038	+ 20 16 29.82	17.725
50 Cassiopeæ . .	4.1	1 54 7.855	5.0140	+ 71 53 36.55	17.641
* γ Andromedæ . .	2.2	1 57 12.508	3.6610	+ 41 48 22.85	17.439
α Arietis . . .	2.1	2 1 1.718	+ 3.3713	+ 22 56 48.21	+ 17.170
α Draconis . . S. P.	3.7	2 1 26.354	1.6238	+115 6 11.59	17.297
* β Trianguli . .	3.1	2 3 3.485	3.5550	+ 34 28 17.06	17.200
ξ¹ Ceti . . .	4.5	2 7 13.361	+ 3.1742	+ 8 20 6.29	17.027
* 4 Ursæ Minoris . S. P.	4.9	2 9 16.701	− 0.3203	+101 56 24.86	16.906
* γ Trianguli . .	4.3	2 10 50.058	+ 3.5514	+ 33 20 34.04	+ 16.841
* 67 Ceti . . .	5.6	2 11 32.759	2.9894	− 6 55 29.43	16.730
* δ Hydri . . .	4.2	2 19 48.670	1.0552	− 69 9 19.50	16.449
ι Cassiopeæ . .	4.6	2 20 5.014	4.8643	+ 66 54 42.63	16.427
ξ² Ceti . . .	4.5	2 22 21.822	+ 3.1839	+ 7 58 16.03	+ 16.291

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0ᵈ.0—0ᵈ.078, Washington.)

Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
5 Ursæ Minoris	S. P.	4.5	2 27 45.610	− 0.1884	+103 49 10.16	+ 16.012
* δ Ceti		4.1	2 33 53.742	+ 3.0729	− 0 8 31.95	15.693
* μ Hydri		5.3	2 33 59.107	− 1.4313	− 79 35 4.56	15.683
* θ Persei		4.2	2 36 45.339	+ 4.0706	+ 48 46 0.88	15.452
γ Ceti		3.6	2 37 39.129	3.1034	+ 2 46 33.90	15.335
* σ Arietis		5.5	2 45 28.465	+ 3.3047	+ 14 37 56.94	+ 15.009
β Ursæ Minoris	S. P.	2.2	2 51 1.596	− 0.2294	+105 23 56.67	14.719
* 47 Cephei (H.)		5.7	2 51 36.556	+ 7.7289	+ 78 59 12.88	14.684
* ε Arietis		4.6	2 52 58.750	3.4213	+ 20 54 14.71	14.606
α Ceti		2.6	2 56 34.869	3.1305	+ 3 39 42.16	14.304
* β Persei (*Algol*) (*var.*)		2.3	3 1 4.579	+ 3.8842	+ 40 32 6.43	+ 14.114
48 Cephei (H.)		5.5	3 6 30.109	7.4125	+ 77 19 59.70	13.719
ζ Arietis		4.8	3 8 38.154	3.4396	+ 20 38 24.15	13.551
α Persei		1.9	3 16 32.519	4.2583	+ 49 28 21.42	13.086
* ρ Octantis	S. P.	5.7	3 18 13.867	+12.9997	− 95 53 59.94	12.964
* ι Hydri		5.7	3 18 41.072	− 1.5953	− 77 47 10.39	+ 13.029
γ² Ursæ Minoris	S. P.	3.2	3 20 54.278	− 0.1325	+107 46 41.35	12.811
* *f* Tauri		4.3	3 24 51.270	+ 3.3051	+ 12 33 45.96	12.564
ε Eridani		3.7	3 27 47.684	2.8237	− 9 49 38.61	12.389
δ Persei		3.1	3 35 9 901	4.2506	+ 47 26 17.98	11.803
* γ Camelopardalis (H.)		4.6	3 38 51.361	+ 6.2409	+ 70 59 43.56	+ 11.534
η Tauri		3.1	3 41 0.267	3.5571	+ 23 46 3.05	11.374
ζ Persei		3.0	3 47 16.814	+ 3.7605	+ 31 33 33.24	10.943
ζ Ursæ Minoris	S. P.	4.6	3 47 57.692	− 2.2483	+101 52 13.69	10.925
* γ Hydri		3.3	3 48 55.759	− 0.9950	− 74 34 22.26	10.983
* ε Persei		3.0	3 50 32.301	+ 4.0104	+ 39 41 39.27	+ 10.715
γ Eridani		3.0	3 52 56.669	2.7986	− 13 49 8.50	10.441
* A¹ Tauri		4.6	3 58 15.076	3.5402	+ 21 46 59.96	10.078
* *c* Persei		4.3	4 0 44.907	4.3377	+ 47 25 14.69	9.932
Groombr. 2320	S. P.	5.5	4 6 1.323	0.1404	+111 54 9.36	9.498
* *o*¹ Eridani		4.2	4 6 32.678	+ 2.9268	− 7 7 20.39	+ 9.611
γ Tauri		3.8	4 13 35.418	+ 3.4091	+ 15 21 50.03	8.952
* η Ursæ Minoris	S. P.	5.0	4 20 41.658	− 1.8147	+103 59 37.19	8.165
ε Tauri		3.6	4 22 15.086	+ 3.4976	+ 18 56 17.06	8.251
η Draconis	S. P.	2.0	4 22 31.062	+ 0.8066	+118 14 20.55	8.220
* δ Mensæ		5.6	4 25 21.707	− 4.2195	− 80 28 9.21	+ 8.053
* *m* Persei		6.0	4 25 44.758	+ 4.2105	+ 42 49 48.82	7.997
A Draconis	S. P.	5.0	4 28 12.041	− 0.1343	+110 59 46.47	7.798
α Tauri (*Aldebaran*)		1.0	4 29 39.952	+ 3.4376	+ 16 17 22.53	7.509
* τ Tauri		4.5	4 35 42.153	3.5955	+ 22 44 49.84	7.184
α Camelopardalis		4.4	4 43 12.742	+ 5.9261	+ 66 9 23.25	+ 6.592
* *i* Tauri		5.2	4 44 59.851	3.5055	+ 18 39 13.15	6.400
ι Aurigæ		2.8	4 49 53.716	3.9008	+ 32 59 34.26	6.017
* ζ Aurigæ		3.9	4 54 51.528	+ 4.1853	+ 40 54 57.69	5.617
ε Ursæ Minoris	S. P.	4.5	4 57 9.282	− 6.3266	+ 97 47 3.30	5.433
11 Orionis		4.7	4 58 20.403	+ 3.4245	+ 15 15 5.98	+ 5.291
* β Eridani		2.9	5 2 29.463	2.9486	− 5 13 40.13	4.921
α Aurigæ (*Capella*)		0.1	5 8 38.215	4.4250	+ 45 53 10.72	4.022
β Orionis (*Rigel*)		0.3	5 9 17.959	2.8814	− 8 19 41.13	4.394
* τ Orionis		3.8	5 12 18.819	+ 2.9127	− 6 57 46.30	+ 4.131

Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0^d.0–0^d.078, Washington.)

	Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
	β Tauri	1.8	5 19 24.085	+ 3.7894	+ 28 30 52.84	+ 3.353
	Groombridge 966	6.4	5 25 9.557	8.0018	+ 74 58 12.78	3.056
	χ Aurigæ	5.0	5 25 38.083	3.9051	+ 32 6 39.74	3.016
	δ Orionis (*var.*)	2.3	5 26 26.273	3.0635	− 0 22 49.40	2.921
*	Groombridge 944	6.4	5 27 7.005	18.6614	+ 85 8 25.43	2.880
	α Leporis	2.7	5 27 55.363	+ 2.6448	− 17 54 2.82	+ 2.797
	ε Orionis	1.8	5 30 40.936	3.0424	− 1 16 19.44	2.559
	α Columbæ	2.7	5 35 42.185	+ 2.1728	− 34 7 57.59	2.077
	ω Draconis S. P.	4.9	5 37 35.449	− 0.3536	+111 11 30.33	1.634
*	κ Orionis	2.3	5 42 35.185	+ 2.8449	− 9 42 31.93	1.525
	ψ^1 Draconis S. P.	4.8	5 43 52.599	− 1.0788	+107 47 52.48	+ 1.683
*	ν Aurigæ	4.1	5 43 56.073	+ 4.1544	+ 39 6 56.92	1.441
*	δ Doradus	4.4	5 44 34.859	0.1049	− 65 46 34.88	1.328
	α Orionis (*var.*)	0.9	5 49 16.232	3.2470	+ 7 23 10.08	0.946
*	β Aurigæ	2.0	5 51 32.013	4.4017	+ 44 56 7.71	0.730
*	θ Aurigæ	2.9	5 52 17.348	+ 4.0920	+ 37 12 15.24	+ 0.586
	ν Orionis	4.5	6 1 20.971	3.4274	+ 14 46 51.00	− 0.148
	22 Camelopardalis (H.)	4.7	6 6 49.820	+ 6.6172	+ 69 21 24.87	0.716
	δ Ursæ Minoris S. P.	4.4	6 7 28 173	−19.4690	+ 93 23 17.52	0.704
*	η Geminorum	3.5	6 8 17.922	+ 3.6228	+ 22 32 16.00	0.742
	μ Geminorum	3.2	6 16 22.005	+ 3.6314	+ 22 34 7.75	− 1.552
*	ψ^1 Aurigæ	5.1	6 16 30.243	4.6264	+ 49 20 33.65	1.454
	α Argûs (*Canopus*)	−0.8	6 21 32.017	1.3305	− 52 38 10.55	1.872
*	ν Geminorum	4.2	6 22 29.453	+ 3.5630	+ 20 16 49.65	1.987
*	χ Draconis S. P.	5.3	6 23 1.256	− 1.0797	+107 18 52.89	1.635
	γ Geminorum	2.0	6 31 24.909	+ 3.4673	+ 16 29 30.12	− 2.788
*	ε Geminorum	3.2	6 37 13.540	3.6033	+ 25 14 18.32	3.257
*	ψ^5 Aurigæ	5.4	6 38 52.905	4.3288	+ 43 41 6.50	3.238
†	α Canis Majoris (*Sirius*)	−1.4	6 40 20.702	2.6436	− 16 34 1.44	4.719
*	θ Geminorum	3.7	6 45 36.332	+ 3.9604	+ 34 5 31.56	3.996
*	ζ Mensæ	5.6	6 49 6.657	− 4.9045	− 80 41 53.62	− 4.183
	51 Cephei (H.)	5.3	6 49 15.172	+29.8670	+ 87 13 0.78	4.314
	50 Draconis S. P.	5.6	6 49 53.149	− 1.9088	+104 41 41.50	4.405
	ε Canis Majoris	1.5	6 54 20.547	+ 2.3577	− 28 49 27.28	4.723
*	ζ Geminorum (*var.*)	4.0	6 57 38.685	3.5623	+ 20 43 46.20	5.009
	δ Canis Majoris	1.9	7 3 57.554	+ 2.4385	− 26 13 13.60	− 5.514
*	66 Aurigæ	5.2	7 4 9.500	4.1363	+ 39 29 52.11	5.522
*	25 Camelopardalis	5.3	7 8 7.605	+12.9513	+ 82 37 10.54	5.905
*	γ^2 Volantis (*var.*)	3.9	7 9 40.094	− 0.4941	− 70 19 19.88	6.003
	δ Draconis S. P.	3.1	7 12 31.768	+ 0.0292	+112 31 48.73	6.326
	δ Geminorum	3.5	7 13 36.808	+ 3.5878	+ 22 10 56.68	− 6.346
	τ Draconis S. P.	4.5	7 17 38.903	− 1.1179	+106 50 49.37	6.773
	Piazzi vii. 67	5.7	7 19 32.287	+ 6.2973	+ 68 41 14.48	6.858
*	β Canis Minoris	3.1	7 21 14.414	3.2596	+ 8 30 30.08	6.998
	α^2 Geminorum (*Castor*)	1.9	7 27 38.771	+ 3.8382	+ 32 7 37.59	7.560
	λ Ursæ Minoris S. P.	6.5	7 32 29.969	−65.3160	+ 91 1 51.52	− 7.884
†	α Canis Min. (*Procyon*)	0.5	7 33 35.765	+ 3.1434	+ 5 30 13.76	9.000
	β Geminorum (*Pollux*)	1.2	7 38 38.776	3.6790	+ 28 17 20.03	8.424
*	26 Lyncis	5.8	7 46 46.487	4.3877	+ 47 50 46.96	9.028
	φ Geminorum	5.0	7 46 49.604	+ 3.6797	+ 27 2 50.76	− 9.036

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1891.0. (January $0^d.0-0^d.078$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
* Groombridge 1374	5.6	7 47 8.280	+ 7.2830	+ 74 12 28.70	− 9.070
ε Draconis S. P.	3.9	7 48 32.275	− 0.1790	+110 0 34.82	9.173
* ω^1 Cancri	6.0	7 54 20.188	+ 3.6371	+ 25 41 26.82	9.590
3 Ursæ Majoris (H.)	5.5	8 1 57.880	6.0471	+ 68 47 38.40	10.172
15 Argûs (ρ)	3.1	8 2 54.124	2.5545	− 23 59 25.51	10.199
* ζ^1 Cancri	4.8	8 5 57.644	+ 3.4463	+ 17 58 31.53	− 10.610
* β Cancri	3.8	8 10 36.239	+ 3.2584	+ 9 31 15.21	10.862
κ Cephei (*pr.*) S. P.	4.4	8 12 33.033	− 1.9257	+102 37 1.42	10.990
* 30 Monocerotis	3.9	8 20 12.822	+ 3.0000	− 3 33 4.24	11.512
* θ Chamæleontis	4.6	8 23 53.906	− 1.7129	− 77 7 57.25	11.757
η Cancri	5.4	8 26 24.372	+ 3.4781	+ 20 48 39.46	− 12.010
Groombr. 3241 S. P.	6.5	8 30 28.440	− 0.2209	+107 50 15.44	12.220
* σ Hydræ	4.5	8 33 3.733	+ 3.1458	+ 3 43 25.16	12.439
* γ Cancri	4.9	8 36 58.712	3.4802	+ 21 51 36.01	12.729
ε Hydræ	3.5	8 41 0.250	3.1817	+ 6 49 5.87	13.010
* σ^2 Cancri (*mean*)	5.5	8 47 35.654	+ 3.6731	+ 30 59 30.29	− 13.413
ι Ursæ Majoris	3.3	8 51 44.599	+ 4.1327	+ 48 28 8.84	13.911
12 Year Cat. 1879 S. P.	5.3	8 52 31.098	− 2.5540	+ 99 51 24.48	13.679
σ^2 Ursæ Majoris	5.0	9 0 47.866	+ 5.3528	+ 67 34 35.48	14.284
κ Cancri	5.1	9 1 50.646	3.2557	+ 11 6 23.59	14.296
* θ Hydræ	4.0	9 8 41.635	+ 3.1260	+ 2 46 25.39	− 15.023
* β Argûs	2.0	9 12 0.090	0.6772	− 69 16 5.64	14.806
ι Argûs	2.6	9 14 10.176	1.6011	− 58 49 3.59	15.000
* α Lyncis	3.3	9 14 24.818	3.6687	+ 34 51 10.44	15.032
α Cephei S. P.	2.6	9 15 58.693	1.4365	+117 52 34.37	15.175
1 Draconis (H.)	4.5	9 21 30.757	+ 8.9869	+ 81 48 26.47	− 15.465
α Hydræ	2.1	9 22 13.874	2.9491	− 8 11 11.26	15.456
d Ursæ Majoris	4.8	9 24 50.123	5.3983	+ 70 18 31.75	15.569
θ Ursæ Majoris	3.2	9 25 33.838	4.0403	+ 52 10 25.11	16.224
β Cephei (*pr.*) S. P.	3.4	9 27 15.099	0.7935	+109 55 4.17	15.757
* 10 Leonis Minoris	4.7	9 27 32.765	+ 3.6937	+ 36 52 52.25	− 15.788
* ο Leonis	3.8	9 35 19.989	+ 3.2068	+ 10 23 16.37	16.227
* ζ Chamæleontis	5.2	9 37 4.810	− 1.5669	− 80 27 5.27	16.285
ε Leonis	3.2	9 39 39.847	+ 3.4148	+ 24 16 32.87	16.431
11 Cephei S. P.	4.8	9 40 19.534	0.9008	+109 11 25.41	16.540
μ Leonis	4.0	9 46 33.862	+ 3.4219	+ 26 31 12.13	− 16.801
* 19 Leonis Minoris	5.2	9 51 0.499	3.6948	+ 41 34 27.89	16.967
79 Draconis S. P.	6.6	9 51 30.365	0.7285	+106 48 47.93	17.014
* π Leonis	5.0	9 54 27.203	3.1742	+ 8 34 0.88	17.141
α Leonis (*Regulus*)	1.3	10 2 34.029	3.2004	+ 12 29 58.89	17.478
32 Ursæ Majoris	5.7	10 10 6.866	+ 4.4190	+ 65 39 5.90	− 17.817
* λ Ursæ Majoris	3.6	10 10 31.321	3.6390	+ 43 27 29.29	17.877
γ^1 Leonis	2.5	10 13 57.785	3.3146	+ 20 23 33.68	18.090
* μ Hydræ	4.1	10 20 49.172	2.9007	− 16 16 49.31	18.314
* β Leonis Minoris	4.3	10 21 34.806	3.4661	+ 37 15 56.07	18.318
* α Antliæ	4.5	10 22 9.816	+ 2.7392	− 30 30 48.03	− 18.220
9 Draconis (H.)	5.0	10 25 49.525	5.2586	+ 76 16 26.72	18.400
ρ Leonis	4.0	10 27 4.348	3.1640	+ 9 52 2.12	18.436
226 Cephei (B.) S. P.	5.7	10 30 21.613	1.0769	+104 20 7.11	18.530
* β Octantis S. P.	4.4	10 34 52.963	+ 6.4745	− 98 2 51.36	− 18.687

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0ᵈ.0—0ᵈ.078, Washington.)

	Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
				h m s	s	° ′ ″	″
*	41 Leonis Minoris . .		5.1	10 37 29.354	+ 3.2705	+ 23 45 31.96	— 18.741
	η Argûs (*var.*) . .		1–6	10 40 49.904	2.3138	— 59 6 41.57	18.87[illegible]
	l Leonis . . .		5.3	10 43 31.703	3.1584	+ 11 7 18.45	18.975
*	δ^3 Chamæleontis . .		4.7	10 44 45.525	0.6363	— 79 57 56.00	18.962
	ι Cephei . .	S. P.	3.6	10 45 47.923	2.1222	+114 22 22.47	18.878
*	46 Leonis Minoris .		3.9	10 47 12.929	+ 3.3692	+ 34 48 9.19	— 19.296
*	Groombridge 1706 .		6.3	10 51 13.310	4.9649	+ 78 21 14.28	19.185
	α Ursæ Majoris . .		2.0	10 56 59.887	+ 3.7461	+ 62 20 21.62	19.366
*	η Octantis . . .		6.1	11 0 4.716	— 0.2190	— 84 0 27.17	19.371
*	p^3 Leonis . . .		6.2	11 1 20.520	+ 3.0597	+ 2 32 49.53	19.486
*	ψ Ursæ Majoris . .		3.2	11 3 32.065	+ 3.3928	+ 45 5 22.11	— 19.506
	δ Leonis . . .		2.7	11 8 18.699	3.1981	+ 21 7 14.72	19.686
*	ν Ursæ Majoris . .		3.7	11 12 35.611	3.2573	+ 33 41 20.51	19.575
	δ Crateris . . .		3.9	11 13 53.490	2.9965	— 14 11 20.07	19.466
	ο Cephei . .	S. P.	5.1	11 14 9.111	2.4446	+112 29 5.10	19.671
	τ Leonis . . .		5.1	11 22 19.900	+ 3.0861	+ 3 27 23.17	— 19.804
	λ Draconis . . .		4.0	11 24 55.618	3.6197	+ 69 55 57.30	19.839
*	ξ Hydræ . . .		3.8	11 27 38.425	2.9432	— 31 15 16.83	19.867
	υ Leonis . . .		4.4	11 31 22.074	3.0713	— 0 13 19.46	19.862
	γ Cephei . .	S. P.	3.5	11 34 52.381	2.4166	+102 58 33.95	20.076
*	χ Ursæ Majoris . .		3.9	11 40 17.667	+ 3.1899	+ 48 23 1.29	— 19.963
	β Leonis . . .		2.2	11 43 29.995	3.0639	+ 15 10 52.73	20.120
	γ Ursæ Majoris . .		2.4	11 48 5.845	3.1811	+ 54 18 2.43	20.028
	Groombr. 4163 .	S. P.	7.0	11 49 32.076	2.8665	+106 11 46.61	20.023
*	π Virginis . . .		4.6	11 55 17.208	3.0741	+ 7 13 19.01	20.087
	ο Virginis . . .		4.3	11 59 39.397	+ 3.0575	+ 9 20 18.12	— 20.015
*	ε Corvi . . .		3.2	12 4 31.116	3.0832	— 22 0 48.61	20.049
	4 Draconis (H.) . .		5.1	12 7 5.675	2.8840	+ 78 13 18.96	20.022
	γ Corvi . . .		2.7	12 10 12.046	3.0797	— 16 56 12.22	20.017
*	2 Canum Venaticorum		6.0	12 10 39.846	3.0217	+ 41 16 1.39	20.065
	β Chamæleontis . .		4.5	12 11 57.682	+ 3.4030	— 78 42 24.38	— 20.002
	η Virginis . . .		4.0	12 14 19.769	3.0667	— 0 3 39.96	20.041
*	6 Ursæ Minoris . .		6.2	12 14 20.556	0.1710	+ 88 18 15.49	19.940
	α^1 Crucis . . .		0.9	12 20 32.317	3.2963	— 62 29 41.71	20.013
*	δ^3 Corvi . . .		3.1	12 24 13.592	3.1027	— 15 54 30.10	20.084
*	β Canum Venaticorum		4.4	12 28 33.976	+ 2.8592	+ 41 56 59.07	— 19.615
	β Corvi . . .		2.8	12 28 39.689	3.1419	— 22 47 38.23	19.962
	κ Draconis . . .		3.8	12 28 49.816	2.5910	+ 70 23 20.55	19.889
*	γ Virginis (*mean*) .		2.9	12 36 8.249	3.0384	— 0 51 6.21	19.811
	21 Cassiopeæ .	S. P.	5.7	12 38 27.080	3.8601	+105 36 28.18	19.751
*	31 Comæ Berenices .		5.1	12 46 23.455	+ 2.929[illegible]	+ 28 8 1.62	— 19.660
	32^2 Camelopardalis (H.).		5.2	12 48 19.853	0.3961	+ 84 0 19.17	19.596
*	γ Cassiopeæ .	S. P.	2.3	12 50 7.860	3.5801	+119 52 25.48	19.562
	α Canum Venaticorum		3.2	12 50 55.776	2.8153	+ 38 54 25.41	19.511
*	43 Cephei (H.) .	S. P.	4.6	12 53 55.448	7.2565	+ 94 19 40.48	19.500
*	δ Muscæ . . .		3.8	12 54 47.261	+ 4.1464	— 70 57 37.60	— 19.474
*	ε Virginis . . .		3.1	12 56 45.091	2.9879	+ 11 32 42.20	19.416
	θ Virginis . . .		4.6	13 4 18.351	3.1013	— 4 57 25.23	19.310
*	20 Canum Venaticorum		4.7	13 12 39.295	2.6966	+ 41 8 47.46	19.034
	α Urs. Min. (*Polaris*)	S. P.	2.2	13 18 54.555	+23.5100	+ 91 16 22.72	— 18.876

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January 0d.0—0d.078, Washington.)

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
α Virginis (*Spica*) .		1.1	13	19	27.020	+ 3.1539	− 10	35	32.26	− 18.898
38 Cassiopeæ .	S. P.	5.9	13	23	7.308	4.3800	+110	17	48.05	18.673
* κ Octantis . . .		5.4	13	23	24.392	8.7687	− 85	13	36.36	18.741
ζ Virginis . . .		3.6	13	29	8.329	3.0532	− 0	2	18.43	18.515
* B. A. C. 4536 . .		5.0	13	29	55.751	2.6822	+ 37	44	27.27	18.537
* m Virginis . . .		5.4	13	35	53.461	+ 3.1434	− 8	9	9.85	− 18.283
η Ursæ Majoris . .		1.9	13	43	14.782	2.3711	+ 49	51	26.37	18.077
η Bootis . . .		2.8	13	49	29.694	2.8568	+ 18	56	39.47	18.168
50 Cassiopeæ .	S. P.	4.1	13	54	7.855	5.0140	+108	6	23.45	17.641
* θ Apodis . . .		Var.	13	54	43.514	5.6792	− 76	16	11.09	17.584
β Centauri . . .		0.7	13	56	7.830	+ 4.1790	− 59	50	48.90	− 17.586
* π Hydræ . . .		3.6	14	0	9.810	3.4012	− 26	9	22.74	17.360
α Draconis . . .		3.7	14	1	26.354	1.6238	+ 64	53	48.41	17.297
* d Bootis . . .		4.8	14	5	25.712	2.7387	+ 25	36	29.30	17.197
* κ Virginis . . .		4.2	14	7	4.881	+ 3.1941	− 9	45	58.24	16.922
* 4 Ursæ Minoris . .		4.9	14	9	16.701	− 0.3203	+ 78	3	35.14	− 16.906
* δ Octantis . . .		5.0	14	9	30.333	+ 8.9931	− 83	10	3.00	16.944
α Bootis (*Arcturus*) .		0.2	14	10	41.389	2.7350	+ 19	45	0.22	18.881
* λ Bootis . . .		4.3	14	12	14.391	2.2826	+ 46	35	20.16	16.658
* λ Virginis . . .		4.7	14	13	12.705	3.2382	− 12	52	9.03	16.743
ι Cassiopeæ .	S. P.	4.6	14	20	5.014	+ 4.8643	+113	5	17.37	− 16.427
θ Bootis . . .		4.1	14	21	29.229	2.0442	+ 52	21	16.74	16.759
ρ Bootis . . .		3.6	14	27	8.012	+ 2.5877	+ 30	51	0.02	15.958
5 Ursæ Minoris . .		4.5	14	27	45.610	− 0.1884	+ 76	10	49.84	16.012
α^2 Centauri . . .		0.2	14	32	13.091	+ 4.0471	− 60	23	17.99	15.371
* μ Hydri . .	S. P.	5.3	14	33	59.107	− 1.4313	−100	24	55.44	− 15.683
* α Apodis . . .		4.1	14	34	20.877	+ 7.2006	− 78	34	52.96	15.675
* 33 Bootis . . .		5.3	14	34	46.842	2.2343	+ 44	52	29.72	15.708
ε Bootis . . .		2.6	14	40	13.664	2.6214	+ 27	32	2.10	15.338
α^2 Libræ . . .		2.9	14	44	50.872	+ 3.3097	− 15	35	18.70	15.165
β Ursæ Minoris . .		2.2	14	51	1.596	− 0.2294	+ 74	36	3.33	− 14.719
* 47 Cephei (H.) .	S. P.	5.7	14	51	36.556	+ 7.7289	+101	0	47.12	14.684
* γ Scorpii . . .		3.4	14	57	41.410	3.4997	− 24	51	11.49	14.374
β Bootis . . .		3.7	14	57	50.437	2.2601	+ 40	49	14.24	14.358
48 Cephei (H.) .	S. P.	5.5	15	6	30.109	7.4125	+102	40	0.30	13.719
* δ Bootis . . .		3.5	15	11	6.547	+ 2.4209	+ 33	43	18.63	− 13.581
β Libræ . . .		2.9	15	11	8.476	3.2219	− 8	58	49.52	13.504
* ρ Octantis . . .		5.7	15	18	13.867	12.9997	− 84	6	0.06	12.964
μ^1 Bootis . . .		4.5	15	20	22.384	+ 2.2663	+ 37	45	34.97	12.777
γ^2 Ursæ Minoris . .		3.2	15	20	54.278	− 0.1325	+ 72	13	18.65	12.811
* β Coronæ Borealis .		3.9	15	23	20.132	+ 2.4751	+ 29	28	53.53	− 12.591
α Coronæ Borealis .		2.3	15	30	4.394	2.5393	+ 27	4	54.34	12.302
* γ Camelop. (H.) .	S. P.	4.6	15	38	51.361	6.2409	+109	0	16.44	11.534
α Serpentis . . .		2.7	15	38	53.939	2.9517	+ 6	46	7.67	11.547
ε Serpentis . . .		3.7	15	45	22.956	+ 2.9872	+ 4	48	22.44	11.044
ζ Ursæ Minoris . .		4.6	15	47	57.692	− 2.2483	+ 78	7	46.31	− 10.925
ε Coronæ Borealis .		4.1	15	53	4.559	+ 2.4833	+ 27	11	37.63	10.608
δ Scorpii . . .		2.6	15	53	53.302	3.5389	− 22	18	39.56	10.523
β^1 Scorpii . . .		2.9	15	59	5.953	3.4810	− 19	30	24.05	10.133
* δ^1 Apodis . . .		4.9	16	4	4.510	+ 8.7797	− 78	25	10.36	− 9.716

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January $0^d.0-0^d.078$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
* φ Herculis	4.2	16	5	19.915	+ 1.8814	+ 45	13	15.17	− 9.578
Groombridge 2320	5.5	16	6	1.323	0.1404	+ 68	5	50.64	9.498
δ Ophiuchi	2.8	16	8	38.002	3.1398	− 3	24	47.64	9.509
* σ Coronæ Borealis (*mean*)	5.3	16	10	35.737	2.2448	+ 34	8	6.89	9.253
τ Herculis	3.9	16	16	27.889	1.8011	+ 46	34	22.78	8.732
* γ Apodis	4.0	16	16	45.282	+ 9.0689	− 78	39	3.90	− 8.732
* η Ursæ Minoris	5.0	16	20	41.658	− 1.8147	+ 76	0	22.81	8.165
η Draconis	2.8	16	22	31.062	+ 0.8066	+ 61	45	39.45	8.220
α Scorpii (*Antares*)	1.2	16	22	43.437	3.6705	− 26	11	22.52	8.295
β Herculis	2.8	16	25	32.053	+ 2.5775	+ 21	43	38.94	8.052
A Draconis	5.0	16	28	12.041	− 0.1343	+ 69	0	13.53	− 7.798
ζ Ophiuchi	2.8	16	31	9.402	+ 3.2992	− 10	20	45.08	7.559
α Trianguli Australis	2.2	16	37	7.681	6.3050	− 68	49	34.80	7.144
η Herculis	3.7	16	39	9.518	2.0539	+ 39	7	47.25	7.018
α Camelopardalis S. P.	4.4	16	43	12.742	5.9261	+113	50	36.75	6.592
κ Ophiuchi	3.4	16	52	30.542	+ 2.8375	+ 9	32	41.72	− 5.826
ε Ursæ Minoris	4.5	16	57	9.282	− 6.3266	+ 82	12	56.70	5.433
d Herculis	5.3	16	57	34.896	+ 2.2113	+ 33	43	35.08	5.392
* η Ophiuchi	2.5	17	4	7.577	3.4356	− 15	35	22.14	4.762
α^1 Herculis (*var.*)	3.1	17	9	40.638	2.7336	+ 14	30	53.80	4.340
* π Herculis	3.4	17	11	15.062	+ 2.0892	+ 36	55	56.05	− 4.225
* θ Ophiuchi	3.3	17	15	18.902	3.6794	− 24	53	24.94	3.938
b Ophiuchi (*var.*)	4.4	17	19	42.800	3.6591	− 24	4	27.93	3.638
* δ Aræ	3.8	17	21	15.695	5.4020	− 60	35	31.93	3.514
Groombr. 966 S. P.	6.4	17	25	9.557	8.0018	+105	1	47.22	3.056
* Groombr. 944 S. P.	6.4	17	27	7.005	+18.6614	+ 94	51	34.57	− 2.880
β Draconis	3.0	17	27	58.224	1.3535	+ 52	22	55.61	2.794
α Ophiuchi	2.2	17	29	52.482	2.7830	+ 12	38	23.08	2.865
* ι Herculis	4.0	17	36	23.396	+ 1.6967	+ 46	3	52.12	2.063
ω Draconis	4.9	17	37	35.449	− 0.3536	+ 68	48	29.67	1.634
μ Herculis	3.5	17	42	11.585	+ 2.3464	+ 27	47	4.68	− 2.317
ψ^1 Draconis	4.8	17	43	52.599	− 1.0788	+ 72	12	7.52	1.683
* θ Herculis	3.9	17	52	30.864	+ 2.0552	+ 37	15	54.81	0.636
γ Draconis	2.5	17	54	4.505	1.3916	+ 51	30	6.41	0.548
γ^2 Sagittarii	2.9	17	58	48.338	3.8516	− 30	25	29.42	− 0.323
* υ Herculis	3.9	18	3	17.446	+ 2.3394	+ 28	44	51.87	+ 0.291
22 Camelop. (H.) S. P.	4.7	18	6	49.820	6.6172	+110	38	35.13	0.716
μ^1 Sagittarii	4.1	18	7	14.684	+ 3.5866	− 21	5	12.32	0.621
δ Ursæ Minoris	4.4	18	7	28.173	−19.4690	+ 86	36	42.48	0.704
η Serpentis	3.5	18	15	40.178	+ 3.1024	− 2	55	34.96	0.695
* λ Sagittarii	2.9	18	21	14.621	+ 3.7026	− 25	28	53.61	+ 1.633
* χ Draconis	5.3	18	23	1.256	− 1.0797	+ 72	41	7.11	1.635
1 Aquilæ	4.0	18	29	16.536	+ 3.2645	− 8	19	11.62	2.225
* ζ Pavonis	4.2	18	30	17.709	7.0286	− 71	31	10.89	2.502
α Lyræ (*Vega*)	0.2	18	33	14.896	2.0313	+ 38	40	56.53	3.172
σ Octantis	5.6	18	44	8.902	+105.6500	− 89	15	57.41	+ 3.821
β Lyræ (*var.*)	3.6	18	46	3.351	2.2142	+ 33	14	10.57	3.985
σ Sagittarii	2.3	18	48	30.391	3.7216	− 26	25	53.54	4.135
51 Cephei (H.) S. P.	5.3	18	49	15.172	+29.8670	+ 92	46	59.22	4.314
50 Draconis	5.6	18	49	53.149	− 1.9088	+ 75	18	18.50	+ 4.405

*** Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.**

MEAN PLACES FOR 1891.0. (January 0ᵈ.0—0ᵈ.078, Washington.)

Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
* γ Lyræ . . .		3.3	18 54 51.990	+ 2.2444	+ 32 32 25.22	+ 4.766
ζ Aquilæ . . .		3.1	19 0 24.022	2.7569	+ 13 42 6.44	5.120
* ι Lyræ . . .		5.2	19 3 24.767	2.1412	+ 35 55 46.44	5.487
* 25 Camelopardalis	S. P.	5.3	19 8 7.605	12.9513	+ 97 22 49.46	5.905
d Sagittarii . . .		5.0	19 11 15.438	3.5122	— 19 8 46.84	6.117
δ Draconis . . .		3.1	19 12 31.768	+ 0.0292	+ 67 28 11.27	+ 6.326
* θ Lyræ . . .		4.4	19 12 35.029	+ 2.0790	+ 37 56 22.97	6.246
τ Draconis . . .		4.5	19 17 38.903	— 1.1179	+ 73 9 10.63	6.773
Piazzi vii. 67 .	S. P.	5.7	19 19 32.287	+ 6.2973	+111 18 45.52	6.858
δ Aquilæ . . .		3.5	19 20 0.153	3.0252	+ 2 53 52.23	6.935
* β Cygni . . .		3.1	19 26 19.543	+ 2.4194	+ 27 43 51.55	+ 7.368
κ Aquilæ . . .		5.0	19 31 1.633	+ 3.2288	— 7 16 9.51	7.757
λ Ursæ Minoris . .		6.5	19 32 29.969	—65.3160	+ 88 58 8.48	7.884
* β Sagittæ . . .		4.5	19 36 9.212	+ 2.6955	+ 17 13 25.24	8.140
γ Aquilæ . . .		2.8	19 41 4.662	2.8522	+ 10 20 52.65	8.551
* δ Cygni . . .		2.9	19 41 34.125	+ 1.8761	+ 44 51 53.36	+ 8.635
α Aquilæ (*Altair*) .		0.9	19 45 27.915	2.9276	+ 8 34 50.68	9.277
* Groombr. 1374 .	S. P.	5.6	19 47 8.280	7.2830	+105 47 31.30	9.070
* ε Pavonis . . .		4.1	19 47 58.298	+ 7.0170	— 73 11 47.09	9.101
ε Draconis . . .		3.9	19 48 32.275	— 0.1799	+ 69 59 25.18	9.173
β Aquilæ . . .		3.9	19 49 57.549	+ 2.9471	+ 6 8 5.22	+ 8.765
* γ Sagittæ . . .		3.6	19 53 54.591	2.6678	+ 19 11 47.28	9.599
* c Sagittarii . . .		4.5	19 55 57.357	3.6967	— 28 0 44.13	9.735
τ Aquilæ . . .		5.7	19 58 48.963	2.9330	+ 6 58 14.21	9.944
3 Ursæ Majoris (H.)	S. P.	5.5	20 1 57.880	6.0471	+111 12 21.60	10.172
* θ Aquilæ . . .		3.3	20 5 40.818	+ 3.0971	— 1 8 40.24	+ 10.463
* 31 Cygni . . .		3.9	20 10 11.975	1.8893	+ 46 24 39.12	10.792
α^2 Capricorni . .		3.7	20 12 0.414	+ 3.3320	— 12 52 56.19	10.922
κ Cephei (*pr.*) . .		4.4	20 12 33.033	— 1.9257	+ 77 22 58.58	10.990
α Pavonis . . .		2.1	20 17 1.764	+ 4.7831	— 57 5 0.71	11.197
γ Cygni . . .		2.3	20 18 19.091	+ 2.1538	+ 39 54 28.47	+ 11.374
π Capricorni . .		5.1	20 21 4.951	3.4394	— 18 34 7.18	11.562
ε Delphini . . .		4.0	20 28 0.359	+ 2.8672	+ 10 55 59.49	12.047
Groombridge 3241 .		6.5	20 30 28.440	— 0.2209	+ 72 9 44.56	12.220
* α Delphini . . .		3.9	20 34 34.514	+ 2.7878	+ 15 31 39.87	12.525
* β Pavonis . . .		3.4	20 35 7.925	+ 5.4722	— 66 35 38.16	+ 12.538
α Cygni . . .		1.4	20 37 42.983	2.0444	+ 44 53 27.32	12.728
* ψ Capricorni . .		4.3	20 39 38.506	3.5605	— 25 39 43.87	12.703
* ε Cygni . . .		2.6	20 41 48.066	2.4277	+ 33 33 43.40	13.343
μ Aquarii . . .		4.8	20 46 46.494	+ 3.2397	— 9 23 31.37	13.295
12 Year Catalogue, 1879.		5.3	20 52 31.098	— 2.5540	+ 80 8 35.52	+ 13.679
ν Cygni . . .		4.1	20 53 6.569	+ 2.2342	+ 40 44 51.56	13.728
σ^2 Ursæ Majoris .	S. P.	5.0	21 0 47.866	5.3528	+112 25 24.52	14.284
61^1 Cygni . . .		5.4	21 2 0.646	2.6833	+ 38 12 48.67	17.536
ζ Cygni . . .		3.3	21 8 17.795	2.5497	+ 29 46 47.76	14.614
* τ Cygni . . .		3.8	21 10 26.423	+ 2.3935	+ 37 34 49.01	+ 15.267
α Cephei . . .		2.6	21 15 58.693	1.4365	+ 62 7 25.63	15.175
1 Pegasi . . .		4.3	21 17 2.704	2.7722	+ 19 20 17.94	15.245
* ζ Capricorni . .		3.8	21 20 26.660	3.4342	— 22 52 59.62	15.389
1 Draconis (H.) .	S. P.	4.5	21 21 30.757	+ 8.9869	+ 98 11 33.53	+ 15.465

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

MEAN PLACES FOR 1891.0. (January $0^{d}.0-0^{d}.078$, Washington.)

Name of Star.	Magni-tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
d Ursæ Majoris . S. P.	4.8	21	24	50.123	+ 5.3983	+109	41	28.25	+ 15.569
β Aquarii . . .	2.9	21	25	49.261	3.1616	− 6	3	1.76	15.667
β Cephei (*pr.*) . .	3.4	21	27	15.099	0.7935	+ 70	4	55.83	15.757
ξ Aquarii . . .	4.8	21	31	56.990	3.1978	− 8	20	34.11	15.977
* 74 Cygni . . .	5.0	21	32	34.812	2.4016	+ 39	55	25.70	16.055
* λ¹ Octantis . . .	5.4	21	34	8.045	+ 9.7707	− 83	13	10.10	+ 16.048
* ζ Chamæleontis . S. P.	5.2	21	37	4.810	− 1.5670	− 99	32	54.73	16.285
ε Pegasi . . .	2.4	21	38	49.972	+ 2.9467	+ 9	22	31.63	16.361
11 Cephei . . .	4.8	21	40	19.534	0.9008	+ 70	48	34.59	16.540
* π² Cygni . . .	4.5	21	42	45.994	2.2133	+ 48	48	19.29	16.546
μ Capricorni . .	5.2	21	47	21.204	+ 3.2759	− 14	3	52.80	+ 16.784
* 16 Pegasi . . .	5.1	21	48	6.148	2.7279	+ 25	24	44.75	16.823
79 Draconis . . .	6.6	21	51	30.365	0.7285	+ 73	11	12.07	17.014
α Aquarii . . .	3.0	22	0	11.131	3.0826	− 0	50	57.19	17.360
α Gruis . . .	1.9	22	1	21.696	3.8053	− 47	29	18.46	17.253
* π Pegasi . . .	4.3	22	5	8.796	+ 2.6602	+ 32	38	36.93	+ 17.584
32 Ursæ Majoris . S. P.	5.7	22	10	6.866	4.4190	+114	20	54.10	17.817
* υ Octantis . . .	6.2	22	10	38.075	13.1238	− 86	31	14.25	17.900
θ Aquarii . . .	4.4	22	11	4.920	3.1690	− 8	19	33.16	17.806
* γ Aquarii . . .	4.0	22	16	1.562	3.1007	− 1	56	11.30	18.043
π Aquarii . . .	4.6	22	19	42.642	+ 3.0647	+ 0	49	27.94	+ 18.159
* σ Aquarii . . .	4.9	22	24	52.694	3.1781	− 11	14	7.98	18.322
9 Draconis . . S. P.	5.0	22	25	49.525	5.2586	+103	43	33.28	18.400
* α Lacertæ . . .	3.9	22	26	48.036	2.4624	+ 49	43	19.60	18.418
η Aquarii . . .	4.2	22	29	45.315	3.0836	− 0	40	45.04	18.461
226 Cephei (B.) . .	5.7	22	30	21.613	+ 1.0769	+ 75	39	52.89	+ 18.530
* 10 Lacertæ . . .	5.0	22	34	22.222	2.6867	+ 38	28	58.92	18.672
* β Octantis . .	4.4	22	34	52.963	6.4745	− 81	57	8.64	18.687
ζ Pegasi . . .	3.5	22	36	1.558	2.9910	+ 10	15	44.92	18.709
* λ Pegasi . . .	4.1	22	41	16.843	2.8853	+ 22	59	31.69	18.877
ι Cephei . . .	3.6	22	45	47.923	+ 2.1222	+ 65	37	37.53	+ 18.878
λ Aquarii . . .	3.8	22	46	55.704	3.1327	− 8	9	34.02	19.077
* Groombr. 1706 S. P.	6.3	22	51	13.310	4.9649	+101	38	45.72	19.185
α Pis. Aus. (*Fomalhaut*)	1.3	22	51	37.607	3.3245	− 30	11	59.32	18.996
* ο Andromedæ . .	3.8	22	56	54.346	2.7501	+ 41	44	24.29	19.289
α Ursæ Majoris . S. P.	2.0	22	56	59.887	+ 3.7461	+117	39	38.38	+ 19.366
α Pegasi (*Markab*) .	2.5	22	59	19.880	2.9850	+ 14	37	7.73	19.304
* φ Aquarii . . .	4.3	23	8	40.667	3.1087	− 6	38	11.32	19.360
ο Cephei . . .	5.1	23	14	9.111	2.4446	+ 67	30	54.90	19.671
* τ Pegasi . . .	4.6	23	15	14.507	2.9637	+ 23	8	37.02	19.657
θ Piscium . . .	4.3	23	22	26.323	+ 3.0412	+ 5	46	48.59	+ 19.728
λ Draconis . . S. P.	4.0	23	24	55.618	3.6197	+110	4	2.70	19.839
* λ Andromedæ . .	3.8	23	32	13.788	2.9226	+ 45	52	2.46	19.473
ι Piscium . . .	4.3	23	34	20.639	3.0842	+ 5	2	7.88	19.484
γ Cephei . . .	3.5	23	34	52.381	2.4166	+ 77	1	26.05	20.076
* ι¹ Aquarii . . .	5.2	23	38	32.917	+ 3.1168	− 18	52	54.49	+ 19.760
* δ Sculptoris . .	4.6	23	43	14.910	3.1322	− 28	43	58.06	19.857
* γ¹ Octantis . . .	5.2	23	45	41.051	3.6847	− 82	37	28.59	19.993
Groombridge 4163 .	6.6	23	49	32.076	2.8665	+ 73	48	13.39	20.023
ω Piscium . . .	4.2	23	53	42.850	3.0785	+ 6	15	35.36	19.931
* 33 Piscium . . .	4.7	23	59	45.382	+ 3.070[illegible]	− 6	19	2.00	+ 20.148

* Apparent right ascensions of stars marked with an asterisk are given after those of standard stars.

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (HEV.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Jan.	h m 1 18	+88° 43′	Jan.	h m 6 49	+87° 13′	Jan.	h m 18 7	+86° 36′	Jan.	h m 19 31	+88° 57′
	s	″		s	″		s	″		s	″
0.3	51.61	52.2	0.5	34.42	3.4	0.9	11.44	36.9	1.1	33.43	68.4
1.3	50.58	52.3	1.5	34.46	3.7	1.9	11.47	36.6	2.0	33.09	68.1
2.3	49.59	52.3	2.5	34.51	4.0	2.9	11.52	36.3	3.0	32.77	67.8
3 3	48.66	52.4	3.5	34.56	4.3	3.9	11.56	35.9	4.0	32.44	67.5
4.3	47.78	52.5	4.5	34.62	4.6	4.9	11.59	35.6	5.0	32.11	67.2
5.3	46.91	52.5	5.5	34.69	4.9	5.9	11.62	35 3	6.0	31.72	66.9
6.3	46.04	52.6	6.5	34.78	5.2	6.9	11.62	35.0	7.0	31.32	66.6
7.3	45.17	52.7	7.5	34.88	5.5	7.9	11.63	34.7	8.0	30.87	66.3
8.3	44.25	52.8	8.5	35.00	5.8	8.9	11.63	34.3	9.0	30.41	66.0
9.2	43.27	52.9	9.5	35.11	6.2	9.9	11.65	34.0	10.0	29.97	65.7
10.2	42.25	53.0	10.5	35.19	6.5	10.9	11.69	33.6	11.0	29.58	65.3
11.2	41.16	53.1	11.5	35.26	6.9	11.9	11.75	33.2	11.9	29.24	64.9
12.2	40.07	53.2	12.5	35.28	7.3	12.9	11.83	32.8	12.9	29.00	64.6
13.2	38.97	53.2	13.5	35.28	7.6	13.9	11.94	32.5	13.9	28.84	64.2
14.2	37.88	53.2	14.5	35.23	8.0	14.9	12.06	32.1	14.9	28.76	63.9
15.2	36.82	53.2	15.5	35.19	8.3	15.9	12.19	31.8	15.9	28.72	63.5
16.2	35.84	53.2	16.4	35.10	8.6	16.9	12.32	31.5	16.9	28.71	63.2
17.2	34.88	53.2	17.4	35.05	8.9	17.9	12.44	31.2	17.9	28.69	62.9
18.2	33.99	53.2	18.4	34.99	9.2	18.9	12.56	30.9	18.9	28.67	62.6
19.2	33.13	53.2	19.4	34.95	9.5	19.9	12.67	30.6	19.9	28.60	62.3
20.2	32.25	53.2	20.4	34.94	9.8	20.9	12.77	30.3	20.9	28.51	62.0
21.2	31.35	53.2	21.4	34.91	10.1	21.9	12.89	30.0	21.9	28.41	61.7
22.2	30.40	53.2	22.4	34.89	10.4	22.9	13.00	29.7	22.9	28.30	61.3
23.2	29.41	53.2	23.4	34.86	10.7	23.9	13.14	29.4	23.9	28.24	61.0
24.2	28.36	53.2	24.4	34.80	11.1	24.9	13.29	29.0	24.9	28.24	60.6
25 2	27.27	53.2	25.4	34.71	11.4	25.9	13.46	28.7	25.9	28.31	60.3
26.2	26.18	53.1	26.4	34.60	11.8	26.9	13.66	28.3	26.9	28.46	59.9
27.2	25.09	53.1	27.4	34.43	12.1	27.9	13.89	28.0	27.9	28.69	59.5
28.2	24.02	53.0	28.4	34.26	12.5	28.9	14.11	27.7	28.9	28.99	59.2
29.2	23.03	52.9	29.4	34.05	12.8	29.9	14.35	27.4	29.9	29.34	58.8
30.2	22.08	52.8	30.4	33.85	13.1	30.9	14.58	27.2	30.9	29.69	58.5
31.2	21.19	52.6	31.4	33.65	13.3	31.9	14.80	26.9	31.9	30.03	58.2
32.2	20.34	52.5	32.4	33.48	13 6	32.9	15.00	26.7	32.9	30.31	57.9

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Feb.	h m 1 17	° ′ +88 43	Feb.	h m 6 49	° ′ +87 13	Feb.	h m 18 7	° ′ +86 36	Feb.	h m 19 31	° ′ +88 57
	s	″		s	″		s	″		s	″
1.2	80.34	52.5	1.4	33.48	13.6	1.9	15.00	26.7	1.9	30.31	57.9
2.2	79.52	52.4	2.4	33.32	13.8	2.9	15.19	26.4	2.9	30.58	57.7
3.2	78.69	52.3	3.4	33.17	14.1	3.9	15.38	26.2	3.9	30.82	57.4
4.2	77.84	52.3	4.4	33.04	14.4	4.9	15.57	25.9	4.9	31.00	57.1
5.2	76.97	52.2	5.4	32.91	14.7	5.9	15.76	25.6	5.9	31.21	56.8
6.2	76.03	52.1	6.4	32.76	15.0	6.9	15.98	25.3	6.9	31.45	56.4
7.2	75.05	52.1	7.4	32.60	15.3	7.9	16.21	25.0	7.9	31.74	56.1
8.2	74.04	52.0	8.4	32.40	15.6	8.9	16.45	24.8	8.9	32.12	55.7
9.2	73.03	51.8	9.4	32.18	15.9	9.9	16.73	24.5	9.9	32.58	55.4
10.2	72.05	51.7	10.4	31.92	16.2	10.9	17.00	24.2	10.9	33.12	55.1
11.2	71.12	51.5	11.4	31.64	16.5	11.9	17.31	24.0	11.9	33.71	54.8
12.2	70.24	51.3	12.4	31.33	16.7	12.9	17.60	23.8	12.9	34.33	54.5
13.2	69.43	51.1	13.4	31.03	17.0	13.9	17.89	23.6	13.9	34.97	54.2
14.2	68.67	51.0	14.4	30.75	17.2	14.9	18.17	23.4	14.9	35.58	53.9
15.1	67.96	50.8	15.4	30.49	17.4	15.9	18.44	23.2	15.9	36.17	53.7
16.1	67.26	50.6	16.4	30.25	17.6	16.9	18.70	23.0	16 9	36.70	53.4
17.1	66.54	50.5	17.4	30.00	17.9	17.8	18.96	22.8	17.9	37.21	53.2
18.1	65.80	50.3	18.4	29.76	18.1	18.8	19.23	22.6	18.9	37.73	52.9
19.1	65.02	50.2	19.4	29.51	18.3	19.8	19.51	22.4	19.9	38.26	52.6
20.1	64 19	50.0	20.4	29.25	18.6	20.8	19.80	22.2	20.9	38.84	52.3
21.1	63.35	49.8	21.4	28.97	18.8	21.8	20.10	22.0	21.9	39.48	52.0
22.1	62.48	49 6	22.4	28.66	19.1	22.8	20.43	21.8	22.9	40.19	51.7
23.1	61.62	49.4	23.4	28.31	19.3	23.8	20.79	21.6	23.9	40.98	51.5
24.1	60.78	49.2	24.3	27.94	19.6	24.8	21.14	21.4	24.9	41.83	51.2
25.1	60.01	48 9	25.3	27.54	19.8	25.8	21.50	21.2	25.9	42.74	50.9
26.1	59.30	48.7	26.3	27.14	20.0	26.8	21.87	21.1	26 9	43.66	50.7
27.1	58.67	48.4	27.3	26.75	20.2	27.8	22.21	21.0	27.9	44.57	50.5
28.1	58.08	48 1	28.3	26.39	20.3	28.8	22.56	20.9	28.9	45.46	50.3
29.1	57.53	47.9	29.3	26.03	20.4	29.8	22.87	20.8	29.9	46.29	50.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	**Declination *North.***		**Right Ascension.**	**Declination *North.***		**Right Ascension.**	**Declination *North.***		**Right Ascension.**	**Declination *North.***
Mar.	h m 1 17	° ′ +88 43	Mar.	h m 6 49	° ′ +87 13	Mar.	h m 18 7	° ′ +86 36	Mar.	h m 19 31	° ′ +88 57
	s	″		s	″		s	″		s	″
1.1	57.53	47.9	1.3	26.03	20.4	1.8	22.87	20.8	1.9	46.29	50.1
2.1	57.01	47.7	2.3	25.70	20.6	2.8	23.19	20.7	2.9	47.08	49.9
3.1	56.50	47.4	3.3	25.38	20.7	3.8	23.49	20.6	3.9	47.83	49.7
4.1	55.93	47.2	4.3	25.09	20.9	4.8	23.80	20.4	4.9	48.57	49.5
5.1	55.35	47.0	5.3	24.77	21.1	5.8	24.11	20.3	5.9	49.31	49.3
6.1	54.71	46.8	6.3	24.45	21.3	6.8	24.44	20.2	6.9	50.09	49.0
7.1	54.07	46.6	7.3	24.10	21.5	7.8	24.77	20.0	7.9	50.93	48.8
8.1	53.41	46.3	8.3	23.73	21.6	8.8	25.13	19.9	8.9	51.86	48.5
9.1	52.76	46.1	9.3	23.32	21.8	9.8	25.50	19.8	9.9	52.85	48.3
10.1	52.17	45.8	10.3	22.90	22.0	10.8	25.88	19.7	10.9	53.90	48.1
11.1	51.63	45.5	11.3	22.47	22.1	11.8	26.27	19.6	11.9	54.98	47.9
12.1	51.17	45.2	12.3	22.03	22.2	12.8	26.64	19.6	12.9	56.08	47.8
13.1	50.77	44.9	13.3	21.60	22.3	13.8	27.00	19.6	13.9	57.15	47.6
14.1	50.44	44.6	14.3	21.18	22.4	14.8	27.35	19.6	14.9	58.19	47.5
15.1	50.14	44.3	15.3	20.78	22.5	15.8	27.69	19.5	15.8	59.17	47.4
16.1	49.84	44.0	16.3	20.43	22.5	16.8	28.01	19.5	16.8	60.12	47.3
17.1	49.52	43.8	17.3	20.07	22.6	17.8	28.33	19.5	17.8	61.04	47.1
18.1	49.19	43.5	18.3	19.70	22.7	18.8	28.67	19.4	18.8	61.96	47.0
19.1	48.81	43.3	19.3	19.34	22.8	19.8	29.00	19.4	19.8	62.90	46.9
20.1	48.39	43.0	20.3	18.96	22.9	20.8	29.36	19.3	20.8	63.89	46.7
21.1	47.96	42.7	21.3	18.54	23.0	21.8	29.73	19.3	21.8	64.95	46.5
22.0	47.54	42.4	22.3	18.11	23.1	22.8	30.11	19.2	22.8	66.07	46.4
23.0	47.13	42.1	23.3	17.66	23.2	23.8	30.52	19.2	23.8	67.25	46.2
24.0	46.76	41.8	24.3	17.19	23.2	24.7	30.90	19.2	24.8	68.48	46.1
25.0	46.49	41.4	25.3	16.70	23.3	25.7	31.31	19.2	25.8	69.73	46.0
26.0	46.27	41.1	26.3	16.22	23.3	26.7	31.68	19.3	26.8	70.95	46.0
27.0	46.14	40.7	27.3	15.77	23.3	27.7	32.06	19.4	27.8	72.15	45.9
28.0	46.05	40.4	28.3	15.34	23.3	28.7	32.39	19.4	28.8	73.28	45.9
29.0	45.98	40.1	29.3	14.92	23.3	29.7	32.73	19.5	29.8	74.37	45.8
30.0	45.92	39.8	30.3	14.54	23.3	30.7	33.06	19.6	30.8	75.41	45.8
31.0	45.87	39.6	31.3	14.18	23.3	31.7	33.36	19.6	31.8	76.39	45.7
32.0	45.77	39.3	32.3	13.82	23.3	32.7	33.68	19.7	32.8	77.38	45.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Apr.	h m 1 17	+88° 48′	Apr.	h m 6 49	+87° 13′	Apr.	h m 18 7	+86° 36′	Apr.	h m 19 32	+88° 57′
	s	″		s	″		s	″		s	″
1.0	45.77	39.3	1.3	13.82	23.3	1.7	33.68	19.7	1.8	17.38	45.7
2.0	45.63	39.0	2.2	13.46	23.3	2.7	34.00	19.7	2.8	18.36	45.6
3.0	45.48	38.8	3.2	13.08	23.3	3.7	34.33	19.7	3.8	19.40	45.5
4.0	45.30	38.5	1.2	12.68	23.3	4.7	34.67	19.8	4.8	20.50	45.5
5.0	45.15	38.2	5.2	12.25	23.4	5.7	35.04	19.8	5.8	21.68	45.4
6.0	45.01	37.8	6.2	11.81	23.4	6.7	35.40	19.9	6.8	22.86	45.3
7.0	44.95	37.5	7.2	11.35	23.4	7.7	35.77	20.0	7.8	24.11	45.3
8.0	44.95	37.2	8.2	10.89	23.3	8.7	36.14	20.1	8.8	25.36	45.3
9.0	45.03	36.8	9.2	10.44	23.2	9.7	36.48	20.3	9.8	26.59	45.3
10.0	45.17	36.5	10.2	10.00	23.2	10.7	36.80	20.4	10.8	27.77	45.3
10.9	45.35	36.2	11.2	9.59	23.1	11.7	37.12	20.6	11.8	28.91	45.4
11.9	45.56	35.9	12.2	9.22	23.0	12.7	37.41	20.7	12.8	29.97	45.4
12.9	45.76	35.6	13.2	8.86	22.9	13.7	37.71	20.9	13.8	31.01	45.5
13.9	45.94	35.4	14.2	8.51	22.8	14.7	37.98	21.0	14.8	32.01	45.5
14.9	46.07	35.1	15.2	8.17	22.7	15.7	38.28	21.1	15.8	33.02	45.5
15.9	46.17	34.8	16.2	7.81	22.6	16.7	38.56	21.2	16.8	34.06	45.5
16.9	46.25	34.5	17.2	7.43	22.6	17.7	38.88	21.3	17.8	35.12	45.5
17.9	46.32	34.3	18.2	7.05	22.5	18.7	39.20	21.4	18.8	36.27	45.5
18.9	46.41	33.9	19.2	6.62	22.5	19.7	39.54	21.6	19.8	37.45	45.6
19.9	46.53	33.6	20.2	6.19	22.4	20.7	39.89	21.7	20.8	38.68	45.6
20.9	46.72	33.3	21.2	5.75	22.3	21.7	40.21	21.9	21.7	39.93	45.6
21.9	46.98	33.0	22.2	5.32	22.2	22.7	40.53	22.1	22.7	41.15	45.7
22.9	47.32	32.6	23.2	4.90	22.0	23.7	40.84	22.3	23.7	42.34	45.8
23.9	47.77	32.3	24.2	4.52	21.8	24.7	41.12	22.6	24.7	43.47	46.0
24.9	48.15	32.0	25.2	4.15	21.6	25.7	41.38	22.8	25.7	44.52	46.1
25.9	48.57	31.8	26.2	3.83	21.5	26.7	41.62	23.0	26.7	45.52	46.2
26.9	49.01	31.5	27.2	3.52	21.3	27.7	41.85	23.2	27.7	46.46	46.3
27.9	49.42	31.3	28.2	3.24	21.1	28.7	42.07	23.4	28.7	47.36	46.4
28.9	49.79	31.0	29.2	2.95	21.0	29.6	42.30	23.6	29.7	48.26	46.5
29.9	50.12	30.8	30.2	2.66	20.9	30.6	42.54	23.8	30.7	49.17	46.6
30.9	50.44	30.6	31.2	2.35	20.8	31.6	42.79	24.0	31.7	50.14	46.7
31.9	50.74	30.3									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North*
May	h m 1 17	+88° 43′	May	h m 6 48	+87° 13′	May	h m 18 7	+86° 36′	May	h m 19 32	+88° 57′
	s	″		s	″		s	″		s	″
1.9	50.74	30.3	1.2	62.35	20.8	1.6	42.79	24.0	1.7	50.14	46.7
2.9	51.08	30.0	2.2	62.02	20.6	2.6	43.03	24.1	2.7	51.15	46.8
3.9	51.47	29.8	3.2	61.67	20.5	3.6	43.29	24.3	3.7	52.22	46.9
4.9	51.90	29.5	4.2	61.31	20.3	4.6	43.56	24.6	4.7	53.30	47.0
5.9	52.43	29.2	5.2	60.95	20.2	5.6	43.82	24.8	5.7	54.40	47.2
6.9	53.01	28.9	6.1	60.60	20.0	6.6	44.07	25.1	6.7	55.47	47.3
7.9	53.62	28.7	7.1	60.27	19.7	7.6	44.29	25.3	7.7	56.51	47.5
8.9	54.29	28.4	8.1	59.96	19.5	8.6	44.49	25.6	8.7	57.48	47.7
9.9	54.95	28.2	9.1	59.67	19.3	9.6	44.68	25.9	9.7	58.37	47.9
10.9	55.58	28.0	10.1	59.43	19.0	10.6	44.85	26.2	10.7	59.21	48.1
11.9	56.19	27.8	11.1	59.19	18.8	11.6	45.00	26.4	11.7	60.00	48.3
12.9	56.75	27.6	12.1	58.98	18.6	12.6	45.18	26.7	12.7	60.77	48.5
13.9	57.27	27.4	13.1	58.76	18.4	13.6	45.34	26.9	13.7	61.56	48.7
14.9	57.77	27.2	14.1	58.53	18.2	14.6	45.52	27.1	14.7	62.38	48.8
15.9	58.28	27.0	15.1	58.27	18.0	15.6	45.70	27.4	15.7	63.23	49.0
16.9	58.80	26.8	16.1	58.01	17.8	16.6	45.90	27.6	16.7	64.13	49.1
17.9	59.38	26.5	17.1	57.71	17.6	17.6	46.10	27.9	17.7	65.07	49.3
18.9	60.02	26.3	18.1	57.41	17.4	18.6	46.29	28.1	18.7	66.03	49.5
19.9	60.73	26.0	19.1	57.12	17.1	19.6	46.48	28.4	19.7	66.98	49.7
20.9	61.51	25.8	20.1	56.84	16.9	20.6	46.65	28.8	20.7	67.88	50.0
21.9	62.33	25.6	21.1	56.59	16.6	21.6	46.80	29.1	21.7	68.73	50.2
22.9	63.15	25.4	22.1	56.39	16.3	22.6	46.92	29.4	22.7	69.49	50.5
23.9	63.97	25.3	23.1	56.20	16.0	23.6	47.01	29.7	23.7	70.18	50.7
24.9	64.78	25.1	24.1	56.04	15.8	24.6	47.10	30.0	24.7	70.80	51.0
25.9	65.54	25.0	25.1	55.91	15.5	25.6	47.16	30.3	25.7	71.36	51.2
26.9	66.25	24.9	26.1	55.79	15.2	26.6	47.24	30.6	26.7	71.91	51.5
27.9	66.94	24.7	27.1	55.65	15.0	27.6	47.32	30.8	27.6	72.46	51.7
28.9	67.59	24.6	28.1	55.53	14.8	28.6	47.41	31.1	28.6	73.02	51.9
29.9	68.27	24.5	29.1	55.38	14.5	29.6	47.50	31.4	29.6	73.64	52.1
30.9	68.98	24.3	30.1	55.22	14.3	30.6	47.61	31.6	30.6	74.30	52.3
31.9	69.73	24.1	31.1	55.03	14.1	31.6	47.72	31.9	31.6	74.99	52.6
32.9	70.55	23.9	32.1	54.85	13.8	32.6	47.82	32.2	32.6	75.70	52.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North*
June	$1^{h}\ 18^{m}$	$+88^{\circ}\ 43'$	June	$6^{h}\ 48^{m}$	$+87^{\circ}\ 13'$	June	$18^{h}\ 7^{m}$	$+86^{\circ}\ 36'$	June	$19^{h}\ 33^{m}$	$+88^{\circ}\ 57'$
	s	″		s	″		s	″		s	″
1.9	10.55	23.9	1.1	54.85	13.8	1.6	47.82	32.2	1.6	15.70	52.8
2.8	11.43	23.8	2.1	54.66	13.5	2.6	47.91	32.6	2.6	16.39	53.1
3.8	12.36	23.6	3.1	54.52	13.2	3.6	47.98	32.9	3.6	17.02	53.4
4.8	13.32	23.5	4.1	54.38	12.9	4.6	48.03	33.3	4.6	17.61	53.7
5.8	14.29	23.4	5.1	54.27	12.5	5.5	48.05	33.6	5.6	18.11	54.0
6.8	15.24	23.3	6.1	54.21	12.2	6.5	48.06	33.9	6.6	18.53	54.3
7.8	16.14	23.3	7.1	54.16	11.9	7.5	48.06	34.3	7.6	18.91	54.6
8.8	17.01	23.2	8.1	54.13	11.6	8.5	48.04	34.6	8.6	19.24	54.9
9.8	17.83	23.1	9.1	54.11	11.3	9.5	48.05	34.8	9.6	19.58	55.2
10.8	18.60	23.1	10.1	54.07	11.1	10.5	48.04	35.1	10.6	19.92	55.4
11.8	19.37	23.0	11.1	54.02	10.8	11.5	48.06	35.4	11.6	20.29	55.7
12.8	20.16	22.9	12.1	53.97	10.5	12.5	48.07	35.7	12.6	20.70	55.9
13.8	20.96	22.8	13.1	53.88	10.3	13.5	48.10	36.0	13.6	21.15	56.2
14.8	21.83	22.7	14.1	53.79	10.0	14.5	48.14	36.3	14.6	21.62	56.5
15.8	22.75	22.6	15.1	53.68	9.7	15.5	48.15	36.6	15.6	22.10	56.8
16.8	23.73	22.5	16.1	53.60	9.4	16.5	48.15	37.0	16.6	22.54	57.1
17.8	24.76	22.4	17.0	53.55	9.0	17.5	48.13	37.3	17.6	22.92	57.4
18.8	25.81	22.4	18.0	53.53	8.7	18.5	48.09	37.7	18.6	23.23	57.8
19.8	26.85	22.3	19.0	53.53	8.4	19.5	48.03	38.0	19.6	23.46	58.1
20.8	27.86	22.3	20.0	53.58	8.0	20.5	47.94	38.3	20.6	23.62	58.4
21.8	28.86	22.3	21.0	53.64	7.7	21.5	47.86	38.7	21.6	23.70	58.8
22.8	29.78	22.4	22.0	53.73	7.4	22.5	47.74	38.9	22.6	23.74	59.1
23.8	30.65	22.4	23.0	53.84	7.1	23.5	47.65	39.2	23.6	23.77	59.4
24.8	31.50	22.4	24.0	53.89	6.9	24.5	47.56	39.5	24.6	23.81	59.7
25.8	32.34	22.4	25.0	53.97	6.6	25.5	47.48	39.8	25.6	23.90	59.9
26.8	33.19	22.4	26.0	54.03	6.3	26.5	47.39	40.0	26.6	24.01	60.2
27.8	34.10	22.4	27.0	54.04	6.0	27.5	47.33	40.3	27.6	24.17	60.5
28.8	35.04	22.3	28.0	54.08	5.7	28.5	47.25	40.6	28.6	24.34	60.8
29.8	36.05	22.3	29.0	54.11	5.4	29.5	47.17	41.0	29.6	24.50	61.1
30.8	37.10	22.3	30.0	54.16	5.1	30.5	47.06	41.3	30.6	24.62	61.5
31.8	38.18	22.3	31.0	54.22	4.8	31.5	46.94	41.7	31.6	24.70	61.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
July	$1^{h}\ 18^{m}$	$+88^{\circ}\ 43'$	July	$6^{h}\ 48^{m}$	$+87^{\circ}\ 12'$	July	$18^{h}\ 7^{m}$	$+86^{\circ}\ 36'$	July	$19^{h}\ 33^{m}$	$+88^{\circ}\ 58'$
	s	″		s	″		s	″		s	″
1.8	38.18	22.3	1.0	54.22	64.8	1.5	46.94	41.7	1.6	24.70	1.8
2.8	39.28	22.4	2.0	54.33	64.5	2.5	46.80	42.0	2.5	24.69	2.2
3.8	40.35	22.4	2.9	54.46	64.1	3.5	46.64	42.3	3.5	24.60	2.5
4 8	41.38	22.5	3.9	54.62	63.8	4.5	46.46	42.6	4.5	24.45	2.9
5.8	42.36	22.6	4.9	54.79	63.4	5.5	46.28	42.9	5.5	24.26	3.2
6.8	43.30	22.7	5.9	54.98	63.1	6.5	46.11	43.2	6.5	24.03	3.6
7.8	44.17	22.8	6.9	55.17	62.9	7.5	45.94	43.5	7.5	23.83	3.9
8.7	45.02	22.8	7.9	55.34	62.6	8.5	45.76	43.7	8.5	23.65	4.2
9.7	45.86	22.9	8.9	55.48	62.3	9.5	45.61	44.0	9.5	23.50	4.5
10.7	46.73	22.9	9.9	55.62	62.1	10.5	45.46	44.3	10.5	23.39	4.7
11.7	47.62	23.0	10.9	55.74	61.8	11.4	45.33	44.5	11.5	23.30	5.0
12.7	48.58	23.0	11.9	55.85	61.5	12.4	45.19	44.8	12.5	23.24	5.4
13.7	49.59	23.1	12.9	55.96	61.2	13.4	45.03	45.1	13.5	23.15	5.7
14.7	50.64	23.1	13.9	56.10	60.9	14.4	44.86	45.4	14.5	23.01	6.1
15.7	51.70	23.2	14.9	56.27	60.6	15.4	44.66	45.8	15.5	22.80	6.4
16.7	52.78	23.3	15.9	56.47	60.2	16.4	44.43	46.1	16.5	22.51	6.8
17.7	53.83	23.5	16.9	56.71	59.9	17.4	44.20	46.4	17.5	22.13	7.1
18.7	54.85	23.6	17.9	56.97	59.6	18.4	43.94	46.7	18.5	21.69	7.5
19.7	55.80	23.8	18.9	57.26	59.3	19.4	43.68	46.9	19.5	21.19	7.8
20.7	56.69	24.0	19.9	57.55	59.0	20.4	43.41	47.2	20.5	20.67	8.1
21.7	57.55	24.1	20.9	57.83	58.7	21.4	43.15	47.4	21.5	20.14	8.4
22.7	58.37	24.3	21.9	58.10	58.5	22.4	42.91	47.6	22.5	19.66	8.7
23.7	59.20	24.4	22.9	58.37	58.2	23.4	42.66	47.9	23.5	19.21	9.0
24.7	60.05	24.5	23.9	58.60	58.0	24.4	42.43	48.1	24.5	18.80	9.3
25.7	60.95	24.7	24.9	58.83	57.7	25.4	42.19	48.3	25.5	18.41	9.6
26.7	61.89	24.8	25.9	59.06	57.4	26.4	41.97	48.6	26.5	18.04	9.9
27.7	62.89	24.9	26.9	59.27	57.1	27.4	41.71	48.9	27.5	17.64	10.2
28.7	63.91	25.1	27.9	59.54	56.8	28.4	41.46	49.2	28.5	17.18	10.6
29.7	64.95	25.3	28.9	59.82	56.5	29.4	41.17	49.4	29.5	16.66	10.9
30.7	65.96	25.5	29.9	60.12	56.2	30.4	40.87	49.7	30.5	16.06	11.3
31.7	66.96	25.7	30.9	60.48	55.9	31.4	40.55	50.0	31.5	15.40	11.6
32.7	67.91	25.9	31.9	60.83	55.6	32.4	40.21	50.2	32.5	14.67	11.9
			32.9	61.20	55.4						

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 19	+88 43	Aug.	6 49	+87 12	Aug.	18 7	+86 36	Aug.	19 32	+88 58
	s	″		s	″		s	″		s	″
1.7	7.91	25.9	1.9	1.20	55.4	1.4	40.21	50.2	1.5	74.67	11.9
2.7	8.79	26.1	2.9	1.57	55.1	2.4	39.89	50.4	2.5	73.92	12.2
3.7	9.60	26.3	3.9	1.93	54.9	3.4	39.56	50.6	3.5	73.17	12.5
4.7	10.36	26.5	4.9	2.26	54.7	4.4	39.25	50.8	4.5	72.45	12.8
5.7	11.12	26.8	5.9	2.59	54.5	5.4	38.96	51.0	5.5	71.75	13.1
6.7	11.88	27.0	6.9	2.91	54.2	6.4	38.66	51.2	6.5	71.10	13.3
7.7	12.65	27.1	7.9	3.21	54.0	7.4	38.39	51.4	7.5	70.49	13.6
8.7	13.47	27.3	8.9	3.50	53.8	8.4	38.11	51.6	8.4	69.90	13.9
9.7	14.35	27.5	9.9	3.81	53.5	9.4	37.82	51.8	9.4	69.30	14.2
10.7	15.26	27.7	10.9	4.14	53.2	10.4	37.52	52.0	10.4	68.66	14.5
11.7	16.21	27.9	11.9	4.51	52.9	11.4	37.20	52.3	11.4	67.96	14.8
12.7	17.16	28.1	12.9	4.89	52.7	12.4	36.85	52.5	12.4	67.19	15.2
13.7	18.07	28.4	13 9	5.32	52.4	13.4	36.49	52.7	13.4	66.34	15.5
14.6	18.97	28.7	14.9	5.75	52.1	14.4	36.11	52.9	14.4	65.43	15.8
15.6	19.80	29.0	15.9	6.22	51.9	15.4	35.71	53.1	15.4	64.45	16.1
16.6	20.56	29.3	16.9	6.67	51.7	16.4	35.32	53.2	16.4	63.44	16.4
17.6	21.27	29.6	17.9	7.12	51.5	17.4	34.94	53.4	17.4	62.41	16.6
18.6	21.95	29.9	18.9	7.53	51.4	18.4	34.56	53.5	18.4	61.42	16.9
19.6	22.60	30.1	19.9	7.94	51.2	19.3	34.19	53.6	19.4	60.47	17.1
20.6	23.27	30.4	20.9	8.32	51.0	20.3	33.84	53.8	20.4	59.59	17.3
21.6	23.97	30.6	21.9	8.70	50.8	21.3	33.51	53.9	21.4	58.69	17.6
22.6	24.71	30.9	22.8	9.08	50.6	22.3	33.15	54.1	22.4	57.84	17.8
23.6	25.49	31.1	23.8	9.47	50.4	23.3	32.81	54.2	23.4	56.97	18.1
24.6	26.31	31.4	24.8	9.88	50.2	24.3	32.42	54.4	24.4	56.08	18.4
25.6	27.14	31 7	25.8	10.33	49.9	25.3	32.05	54.6	25.4	55.12	18.7
26.6	27.98	32.0	26.8	10.80	49.7	26.3	31.64	54.8	26.4	54.11	19.0
27.6	28.78	32.3	27.8	11.31	49.5	27.3	31.22	55.0	27.4	53.00	19.2
28.6	29.51	32 6	28.8	11.81	49.3	28.3	30.80	55.1	28.4	51.86	19.5
29.6	30.19	32.9	29.8	12.32	49.1	29.3	30.36	55.2	29.4	50.67	19.8
30.6	30.80	33.3	30.8	12.83	49.0	30.3	29.94	55.3	30.4	49.47	20.0
31.6	31.35	33.6	31.8	13.31	48.9	31.3	29.52	55.4	31.4	48.30	20.2
32.6	31.88	33.9	32.8	13.77	48.7	32.3	29.12	55.5	32.4	47.15	20.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	$1^h\ 19^m$	$+88^\circ\ 43'$	Sept.	$6^h\ 49^m$	$+87^\circ\ 12'$	Sept.	$18^h\ 7^m$	$+86^\circ\ 36'$	Sept.	$19^h\ 32^m$	$+88^\circ\ 58'$
	s	″		s	″		s	″		s	″
1.6	31.88	33.9	1.8	13.77	48.7	1.3	29.12	55.5	1.4	47.15	20.4
2.6	32.39	34.2	2.8	14.22	48.6	2.3	28.74	55.5	2.4	46.07	20.6
3.6	32.90	34.5	3.8	14.65	48.5	3.3	28.36	55.6	3.4	45.02	20.8
4.6	33.46	34.8	4.8	15.06	48.3	4.3	27.99	55.7	4.4	44.00	21.0
5.6	34.06	35.1	5.8	15.50	48.2	5.3	27.62	55.8	5.4	42.99	21.2
6.6	34.70	35.4	6.8	15.94	48.0	6.3	27.24	55.9	6.4	41.96	21.4
7.6	35.38	35.7	7.8	16.41	47.8	7.3	26.86	56.0	7.4	40.89	21.7
8.6	36.07	36.0	8.8	16.91	47.6	8.3	26.44	56.1	8.4	39.74	21.9
9.6	36.73	36.4	9.8	17.43	47.5	9.3	26.01	56.2	9.4	38.53	22.1
10.6	37.36	36.7	10.8	17.98	47.3	10.3	25.56	56.3	10.4	37.26	22.4
11.6	37.95	37.1	11.8	18.55	47.2	11.3	25.11	56.4	11.4	35.90	22.6
12.6	38.46	37.5	12.8	19.11	47.1	12.3	24.64	56.4	12.4	34.53	22.8
13.6	38.91	37.9	13.8	19.66	47.0	13.3	24.18	56.5	13.4	33.15	23.0
14.6	39.31	38.3	14.8	20.20	46.9	14.3	23.74	56.5	14.4	31.77	23.1
15.6	39.67	38.6	15.8	20.71	46.8	15.3	23.32	56.5	15.4	30.46	23.3
16.6	40.04	39.0	16.8	21.20	46.8	16.3	22.89	56.5	16.4	29.17	23.4
17.6	40.43	39.3	17.8	21.68	46.7	17.3	22.48	56.5	17.3	27.94	23.5
18.6	40.84	39.6	18.8	22.15	46.6	18.3	22.06	56.5	18.3	26.73	23.7
19.6	41.31	40.0	19.8	22.64	46.5	19.3	21.69	56.6	19.3	25.54	23.8
20.5	41.80	40.3	20.8	23.13	46.4	20.3	21.27	56.6	20.3	24.34	24.0
21.5	42.32	40.7	21.8	23.65	46.2	21.3	20.85	56.7	21.3	23.10	24.2
22.5	42.83	41.0	22.8	24.18	46.1	22.3	20.40	56.7	22.3	21.78	24.4
23.5	43.34	41.4	23.8	24.76	46.0	23.2	19.95	56.8	23.3	20.41	24.6
24.5	43.78	41.8	24.8	25.33	45.9	24.2	19.47	56.8	24.3	18.97	24.8
25.5	44.15	42.2	25.8	25.91	45.9	25.2	19.00	56.8	25.3	17.50	24.9
26.5	44.45	42.6	26.8	26.50	45.8	26.2	18.55	56.8	26.3	16.01	25.0
27.5	44.70	43.0	27.7	27.06	45.8	27.2	18.10	56.7	27.3	14.54	25.1
28.5	44.89	43.4	28.7	27.59	45.8	28.2	17.65	56.6	28.3	13.11	25.2
29.5	45.06	43.8	29.7	28.12	45.8	29.2	17.23	56.6	29.3	11.74	25.3
30.5	45.23	44.1	30.7	28.61	45.8	30.2	16.82	56.5	30.3	10.41	25.4
31.5	45.42	44.5	31.7	29.08	45.7	31.2	16.44	56.5	31.3	9.12	25.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Oct.	h m 1 19	+88° 43′	Oct.	h m 6 49	+87° 12′	Oct.	h m 18 7	+86° 36′	Oct.	h m 19 31	+88° 58′
	s	″		s	″		s	″		s	″
1.5	45.42	44.5	1.7	29.08	45.7	1.2	16.44	56.5	1.3	69.12	25.5
2.5	45.65	44.8	2.7	29.56	45.7	2.2	16.03	56.4	2.3	67.87	25.6
3.5	45.92	45.2	3.7	30.04	45.7	3.2	15.64	56.4	3.3	66.62	25.7
4.5	46.23	45.5	4.7	30.56	45.6	4.2	15.23	56.4	4.3	65.32	25.8
5.5	46.56	45.9	5.7	31.10	45.6	5.2	14.82	56.4	5.3	63.99	25.9
6.5	46.88	46.3	6.7	31.65	45.5	6.2	14.38	56.4	6.3	62.60	26.0
7.5	47.15	46.7	7.7	32.23	45.5	7.2	13.92	56.3	7.3	61.13	26.1
8.5	47.38	47.1	8.7	32.83	45.4	8.2	13.47	56.3	8.3	59.61	26.2
9.5	47.56	47.5	9.7	33.44	45.5	9.2	12.98	56.2	9.3	58.06	26.3
10.5	47.66	48.0	10.7	34.02	45.5	10.2	12.53	56.1	10.3	56.48	26.4
11.5	47.69	48.4	11.7	34.60	45.5	11.2	12.09	56.0	11.3	54.93	26.4
12.5	47.69	48.8	12.7	35.15	45.6	12.2	11.65	55.8	12.3	53.40	26.4
13.5	47.67	49.2	13.7	35.67	45.6	13.2	11.23	55.7	13.3	51.96	26.4
14.5	47.67	49.5	14.7	36.16	45.7	14.2	10.86	55.6	14.3	50.54	26.4
15.5	47.68	49.9	15.7	36.67	45.7	15.2	10.45	55.5	15.3	49.19	26.5
16.5	47.73	50.2	16.7	37.16	45.8	16.2	10.07	55.4	16.3	47.86	26.5
17.5	47.82	50.6	17.7	37.65	45.8	17.2	9.68	55.3	17.3	46.53	26.5
18.5	47.94	51.0	18.7	38.19	45.8	18.2	9.28	55.2	18.3	45.17	26.6
19.5	48.07	51.4	19.7	38.72	45.8	19.2	8.86	55.1	19.3	43.77	26.6
20.5	48.17	51.8	20.7	39.28	45.8	20.2	8.43	55.0	20.2	42.32	26.7
21.5	48.25	52.2	21.7	39.88	45.9	21.2	8.00	54.9	21.2	40.81	26.7
22.5	48.23	52.6	22.7	40.45	45.9	22.2	7.56	54.8	22.2	39.26	26.8
23.5	48.17	53.0	23.7	41.02	46.0	23.2	7.12	54.6	23.2	37.69	26.8
24.5	48.04	53.4	24.7	41.60	46.1	24.2	6.71	54.4	24.2	36.14	26.8
25.5	47.82	53.8	25.7	42.13	46.2	25.2	6.30	54.2	25.2	34.63	26.7
26.4	47.60	54.2	26.7	42.64	46.3	26.2	5.91	54.0	26.2	33.17	26.7
27.4	47.36	54.6	27.7	43.13	46.4	27.2	5.54	53.8	27.2	31.77	26.6
28.4	47.13	54.9	28.7	43.60	46.6	28.2	5.19	53.7	28.2	30.43	26.5
29.4	46.94	55.3	29.7	44.05	46.7	29.2	4.86	53.5	29.2	29.13	26.5
30.4	46.78	55.6	30.7	44.50	46.7	30.1	4.51	53.3	30.2	27.87	26.4
31.4	46.66	56.0	31.7	44.97	46.8	31.1	4.18	53.2	31.2	26.58	26.4
32.4	46.56	56.3	32.7	45.47	46.9	32.1	3.81	53.0	32.2	25.27	26.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 19	+88 43	Nov.	6 49	+87 12	Nov.	18 6	+86 36	Nov.	19 30	+88 58
	s	″		s	″		s	″		s	″
1.4	46.56	56.3	1.7	45.47	46.9	1.1	63.81	53.0	1.2	85.27	26.4
2.4	46.46	56.7	2.7	45.99	47.0	2.1	63.44	52.9	2.2	83.90	26.4
3.4	46.34	57.1	3.7	46.51	47.1	3.1	63.05	52.7	3.2	82.48	26.3
4.4	46.18	57.5	4.7	47.06	47.2	4.1	62.66	52.5	4.2	81.01	26.3
5.4	45.97	57.9	5.7	47.62	47.3	5.1	62.28	52.3	5.2	79.51	26.3
6.4	45.66	58.3	6.6	48.17	47.5	6.1	61.87	52.1	6.2	77.98	26.2
7.4	45.30	58.7	7.6	48.69	47.6	7.1	61.50	51.8	7.2	76.48	26.1
8.4	44.90	59.1	8.6	49.20	47.8	8.1	61.14	51.6	8.2	75.01	26.0
9.4	44.45	59.4	9.6	49.67	48.0	9.1	60.81	51.3	9.2	73.60	25.8
10.4	44.02	59.8	10.6	50.12	48.2	10.1	60.47	51.0	10.2	72.26	25.7
11.4	43.59	60.1	11.6	50.54	48.4	11.1	60.17	50.8	11.2	70.98	25.6
12.4	43.20	60.4	12.6	50.96	48.6	12.1	59.87	50.6	12.2	69.75	25.4
13.4	42.86	60.7	13.6	51.40	48.7	13.1	59.57	50.3	13.2	68.54	25.3
14.4	42.54	61.1	14.6	51.84	48.9	14.1	59.27	50.1	14.2	67.30	25.2
15.4	42.24	61.4	15.6	52.30	49.0	15.1	58.95	49.9	15.2	66.05	25.1
16.4	41.93	61.7	16.6	52.77	49.2	16.1	58.63	49.7	16.2	64.74	25.0
17.4	41.59	62.1	17.6	53.27	49.3	17.1	58.30	49.5	17.2	63.41	24.9
18.4	41.20	62.5	18.6	53.75	49.5	18.1	57.95	49.2	18.2	62.01	24.8
19.4	40.73	62.8	19.6	54.25	49.7	19.1	57.64	49.0	19.2	60.62	24.7
20.4	40.20	63.2	20.6	54.72	49.9	20.1	57.32	48.7	20.2	59.23	24.5
21.4	39.62	63.6	21.6	55.17	50.2	21.1	57.02	48.4	21.2	57.88	24.4
22.4	38.98	63.9	22.6	55.58	50.5	22.1	56.73	48.1	22.2	56.60	24.2
23.4	38.33	64.2	23.6	55.98	50.7	23.1	56.48	47.8	23.2	55.39	24.0
24.4	37.68	64.5	24.6	56.34	50.9	24.1	56.26	47.5	24.2	54.24	23.8
25.4	37.05	64.8	25.6	56.68	51.1	25.1	56.02	47.2	25.2	53.15	23.6
26.4	36.47	65.1	26.6	57.02	51.3	26.1	55.81	46.9	26.2	52.09	23.4
27.1	35.93	65.3	27.6	57.35	51.6	27.1	55.59	46.6	27.1	51.07	23.2
28.4	35.40	65.6	28.6	57.71	51.8	28.1	55.38	46.3	28.1	50.03	23.0
29.4	34.90	65.9	29.6	58.09	52.0	29.1	55.14	46.1	29.1	48.98	22.9
30.4	34.39	66.2	30.6	58.49	52.2	30.1	54.89	45.8	30.1	47.83	22.7
31.3	33.84	66.5	31.6	58.90	52.4	31.1	54.64	45.5	31.1	46.65	22.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Dec.	h m 1 19	° ′ +88 44	Dec.	h m 6 49	° ′ +87 12	Dec.	h m 18 6	° ′ +86 36	Dec.	h m 19 30	° ′ +88 58
	s	″		s	″		s	″		s	″
1.3	33.84	6.5	1.6	58.90	52.4	1.1	54.64	45.5	1.1	46.65	22.5
2.3	33.23	6.8	2.6	59.32	52.6	2.1	54.37	45.2	2.1	45.45	22.4
3.3	32.57	7.1	3.6	59.74	52.9	3.1	54.12	44.9	3.1	44.24	22.2
4.3	31.83	7.4	4.6	60.13	53.2	4.1	53.88	44.6	4.1	43.02	21.9
5.3	31.04	7.7	5.6	60.50	53.5	5.0	53.65	44.2	5.1	41.86	21.7
6.3	30.22	8.0	6.6	60.85	53.8	6.0	53.44	43.9	6.1	40.75	21.4
7.3	29.38	8.3	7.6	61.16	54.1	7.0	53.28	43.5	7.1	39.72	21.1
8.3	28.57	8.5	8.6	61.43	54.4	8.0	53.11	43.2	8.1	38.76	20.9
9.3	27.79	8.7	9.6	61.70	54.7	9.0	52.97	42.8	9.1	37.87	20.6
10.3	27.05	8.9	10.6	61.97	54.9	10.0	52.83	42.5	10.1	37.02	20.4
11.3	26.35	9.2	11.5	62.22	55.2	11.0	52.69	42.2	11.1	36.17	20.1
12.3	25.67	9.4	12.5	62.51	55.4	12.0	52.54	41.9	12.1	35.31	19.9
13.3	25.00	9.6	13.5	62.79	55.7	13.0	52.40	41.6	13.1	34.43	19.7
14.3	24.33	9.9	14.5	63.11	55.9	14.0	52.23	41.3	14.1	33.50	19.5
15.3	23.61	10.1	15.5	63.44	56.2	15.0	52.06	41.0	15.1	32.55	19.2
16.3	22.81	10.3	16.5	63.73	56.5	16.0	51.89	40.7	16.1	31.56	19.0
17.3	21.96	10.6	17.5	64.03	56.8	17.0	51.75	40.3	17.1	30.60	18.7
18.3	21.05	10.8	18.5	64.32	57.1	18.0	51.61	40.0	18.1	29.66	18.4
19.3	20.08	11.0	19.5	64.55	57.5	19.0	51.51	39.6	19.1	28.79	18.1
20.3	19.10	11.2	20.5	64.76	57.8	20.0	51.41	39.2	20.1	28.01	17.8
21.3	18.12	11.4	21.5	64.94	58.1	21.0	51.36	38.8	21.1	27.29	17.5
22.3	17.15	11.5	22.5	65.09	58.5	22.0	51.31	38.5	22.1	26.67	17.2
23.3	16.23	11.7	23.5	65.23	58.8	22.9	51.26	38.1	23.1	26.10	16.9
24.3	15.37	11.8	24.5	65.37	59.1	23.9	51.24	37.8	24.1	25.54	16.6
25.3	14.54	11.9	25.5	65.52	59.3	24.9	51.19	37.5	25.1	25.00	16.3
26.3	13.74	12.1	26.5	65.69	59.6	25.9	51.15	37.2	26.1	24.45	16.0
27.3	12.94	12.2	27.5	65.87	59.9	26.9	51.09	36.8	27.1	23.85	15.8
28.3	12.11	12.4	28.5	66.05	60.2	27.9	51.03	36.5	28.1	23.23	15.5
29.3	11.26	12.6	29.5	66.26	60.5	28.9	50.97	36.2	29.1	22.55	15.2
30.3	10.36	12.7	30.5	66.46	60.8	29.9	50.88	35.8	30.1	21.88	14.9
31.3	9.38	12.9	31.5	66.66	61.2	30.9	50.84	35.5	31.1	21.21	14.6
32.3	8.35	13.1	32.5	66.81	61.5	31.9	50.80	35.1	32.1	20.57	14.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		γ Pegasi. (*Algenib.*)		β Hydri.		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 2	° ′ +28 29	h m 0 7	° ′ +14 34	h m 0 19	° ′ −77 51	h m 0 24	° ′ − 4 33
	s	″	s	″	s	″	s	″
(Dec.30.2)	43.93 −.14	21.1 −0.8	36.18 −.11	36.6 −0.7	60.24 −.90	91.9 +0.7	27.52 −.11	43.6 −0.6
Jan. 9.2	43.79 .13	20.2 1.1	36.07 .11	35.8 0.9	59.37 .85	90.8 1.3	27.42 .11	44.2 0.5
19.2	43.66 .13	19.0 1.2	35.96 .10	34.8 1.0	58.55 .78	89.2 1.9	27.31 .10	44.7 0.4
29.2	43.54 .11	17.6 1.5	35.86 .09	33.8 1.0	57.81 .69	87.0 2.4	27.22 .09	45.0 0.3
Feb. 8.1	43.44 .09	16.1 1.6	35.78 .07	32.8 1.0	57.18 .58	84.3 2.9	27.13 .08	45.3 −0.2
18.1	43.36 −.06	14.5 −1.6	35.72 −.05	31.8 −0.9	56.66 −.45	81.2 +3.2	27.07 −.06	45.4 0.0
28.1	43.32 −.03	12.9 1.6	35.68 −.02	30.9 0.8	56.28 .31	77.9 3.5	27.02 −.03	45.2 +0.2
Mar. 10.0	43.31 +.01	11.4 1.5	35.68 +.01	30.1 0.7	56.04 .16	74.2 3.7	27.01 .00	44.9 0.4
20.0	43.34 .05	10.0 1.3	35.71 .05	29.5 0.5	55.96 −.01	70.4 3.8	27.02 +.04	44.3 0.7
30.0	43.42 .10	8.8 1.0	35.78 .09	29.2 −0.2	56.03 +.15	66.5 3.8	27.08 .07	43.5 0.9
Apr. 9.0	43.54 +.15	7.9 −0.7	35.89 +.13	29.1 +0.1	56.26 +.31	62.7 +3.8	27.17 +.11	42.5 +1.2
18.9	43.71 .19	7.4 −0.4	36.05 .17	29.3 0.4	56.65 .46	58.9 3.7	27.30 .15	41.2 1.4
28.9	43.93 .23	7.2 0.0	36.24 .22	29.8 0.7	57.19 .60	55.3 3.5	27.48 .19	39.7 1.6
May 8.9	44.18 .27	7.4 +0.4	36.48 .25	30.6 1.0	57.86 .74	51.9 3.2	27.69 .23	38.0 1.8
18.8	44.47 .30	8.0 0.8	36.74 .26	31.8 1.3	58.67 .86	48.9 2.8	27.94 .26	36.2 1.9
28.8	44.78 +.33	8.9 +1.1	37.04 +.30	33.2 +1.5	59.60 +.97	46.2 +2.4	28.22 +.29	34.1 +2.0
June 7.8	45.12 .34	10.2 1.4	37.35 .32	34.8 1.8	60.61 1.05	44.0 2.0	28.51 .31	32.0 2.1
17.8	45.46 .35	11.9 1.7	37.67 .33	36.7 2.0	61.69 1.10	42.3 1.5	28.83 .32	29.9 2.1
27.7	45.81 .34	13.9 2.1	37.99 .32	38.8 2.1	62.81 1.13	41.1 0.9	29.15 .32	27.8 2.1
July 7.7	46.15 .33	16.0 2.3	38.31 .31	40.9 2.2	63.94 1.13	40.4 +0.4	29.46 .31	25.8 2.0
17.7	46.47 +.31	18.4 +2.4	38.62 +.29	43.1 +2.2	65.06 +1.10	40.4 −0.2	29.77 +.30	23.9 +1.8
27.7	46.77 .28	20.8 2.5	38.91 .27	45.3 2.2	66.13 1.03	40.9 0.8	30.07 .28	22.2 1.6
Aug. 6.6	47.04 .25	23.4 2.5	39.16 .24	47.4 2.1	67.13 .94	42.0 1.3	30.33 .25	20.6 1.4
16.6	47.27 .21	25.9 2.5	39.39 .21	49.5 2.0	68.01 .81	43.5 1.8	30.57 .22	19.4 1.2
26.6	47.46 .17	28.4 2.4	39.58 .17	51.4 1.8	68.76 .67	45.6 2.2	30.78 .19	18.4 0.9
Sept. 5.5	47.61 +.13	30.8 +2.3	39.73 +.13	53.1 +1.6	69.35 +.50	48.0 −2.6	30.95 +.15	17.6 +0.6
15.5	47.72 .09	33.1 2.2	39.85 .10	54.7 1.4	69.76 .32	50.8 2.8	31.08 .11	17.2 0.3
25.5	47.80 .05	35.2 2.0	39.93 .06	56.0 1.2	69.99 +.13	53.7 3.0	31.17 .06	17.0 +0.1
Oct. 5.5	47.83 +.02	37.1 1.8	39.97 +.02	57.1 1.0	70.03 −.04	56.7 3.0	31.23 .05	17.0 −0.1
15.4	47.83 −.02	38.8 1.6	39.98 −.01	58.0 0.8	69.88 .24	59.7 2.9	31.26 +.01	17.3 0.3
25.4	47.80 −.05	40.2 +1.3	39.96 −.03	58.7 +0.5	69.54 −.41	62.6 −2.7	31.26 −.02	17.7 −0.5
Nov. 4.4	47.74 .07	41.4 1.0	39.91 .06	59.1 0.3	69.05 .57	65.1 2.4	31.23 .04	18.3 0.6
14.4	47.66 .09	42.2 0.7	39.85 .08	59.3 +0.1	68.41 .70	67.3 2.0	31.18 .06	19.0 0.7
24.3	47.55 .11	42.7 0.4	39.76 .09	59.3 −0.1	67.66 .80	69.0 1.5	31.11 .08	19.7 0.7
Dec. 4.3	47.44 .12	43.0 +0.1	39.67 .10	59.1 0.3	66.82 .86	70.2 0.9	31.02 .09	20.5 0.7
14.3	47.31 −.13	42.9 −0.2	39.56 −.11	58.8 −0.5	65.93 −.92	70.7 −0.2	30.93 −.10	21.2 −0.7
24.2	47.17 .14	42.5 0.5	39.45 .11	58.2 0.6	65.02 .91	70.7 +0.4	30.83 .10	21.9 0.7
34.2	47.04 −.14	41.8 −0.8	39.34 −.11	57.5 −0.7	64.11 −.90	70.0 +1.0	30.72 −.11	22.5 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cassiopeæ.		β Ceti.		21 Cassiopeæ.		ε Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 34	° ′ +55 56	h m 0 38	° ′ −18 34	h m 0 38	° ′ +74 23	h m 0 57	° ′ + 7 18
	s	″	s	″	s	″	s	″
(Dec. 30.3)	18.13 −.29	32.0 −0.1	6.22 −.12	80.0 −0.6	25.42 −.71	45.2 +0.3	16.27 −.11	7.0 −0.6
Jan. 9.2	17.85 .29	31.6 0.6	6.10 .12	80.5 0.3	24.70 .72	45.2 −0.3	16.16 .11	6.3 0.6
19.2	17.56 .28	30.7 1.2	5.98 .11	80.7 −0.1	23.98 .70	44.6 0.9	16.04 .12	5.6 0.7
29.2	17.28 .26	29.4 1.6	5.87 .10	80.6 +0.2	23.29 .66	43.5 1.4	15.93 .11	5.0 0.6
Feb. 8.1	17.03 .23	27.6 1.9	5.77 .09	80.3 0.5	22.66 .59	41.8 1.9	15.82 .10	4.4 0.6
18.1	16.82 −.19	25.6 −2.2	5.69 −.07	79.7 +0.7	22.11 −.49	39.6 −2.3	15.73 −.08	3.8 −0.5
28.1	16.66 .13	23.2 2.4	5.63 .04	78.8 1.0	21.67 .37	37.1 2.6	15.65 .06	3.4 0.4
Mar. 10.1	16.55 −.07	20.8 2.5	5.60 −.01	77.7 1.3	21.36 .24	34.3 2.8	15.60 −.03	3.1 −0.2
20.1	16.51 .00	18.3 2.5	5.60 +.02	76.3 1.5	21.20 −.09	31.4 2.9	15.59 .00	2.9 0.0
30.0	16.54 +.07	15.8 2.3	5.64 .06	74.7 1.7	21.18 +.06	28.5 2.9	15.61 +.04	3.0 +0.2
Apr. 9.0	16.65 +.14	13.6 −2.1	5.72 +.10	72.8 +2.0	21.32 +.22	25.6 −2.7	15.67 +.08	3.3 +0.4
19.0	16.83 .21	11.6 1.8	5.84 .14	70.8 2.2	21.62 .37	23.0 2.5	15.78 .13	3.9 0.7
29.0	17.08 .28	9.9 1.4	6.01 .18	68.6 2.3	22.06 .50	20.7 2.1	15.92 .17	4.7 0.9
May 8.9	17.40 .35	8.7 1.0	6.21 .22	66.2 2.4	22.62 .62	18.8 1.7	16.11 .21	5.8 1.2
18.9	17.78 .40	7.9 −0.5	6.45 .26	63.8 2.4	23.29 .72	17.3 1.2	16.34 .24	7.1 1.4
28.9	18.20 +.44	7.6 0.0	6.73 +.29	61.4 +2.4	24.06 +.79	16.4 −0.7	16.60 +.27	8.7 +1.6
June 7.8	18.65 .46	7.8 +0.5	7.03 .31	59.0 2.3	24.88 .84	16.0 −0.1	16.88 .29	10.4 1.8
17.8	19.12 .48	8.6 1.0	7.34 .32	56.7 2.2	25.75 .87	16.1 +0.4	17.19 .31	12.3 1.9
27.8	19.60 .46	9.7 1.4	7.67 .33	54.6 2.0	26.64 .88	16.8 1.0	17.51 .32	14.3 2.0
July 7.8	20.08 .47	11.4 1.8	8.00 .33	52.6 1.8	27.51 .86	18.0 1.5	17.83 .32	16.3 2.0
17.7	20.54 +.45	13.4 +2.2	8.33 +.32	50.9 +1.5	28.36 +.82	19.8 +1.9	18.14 +.31	18.4 +2.0
27.7	20.98 .42	15.8 2.5	8.64 .30	49.5 1.2	29.16 .77	21.9 2.4	18.45 .29	20.3 1.9
Aug. 6.7	21.38 .38	18.5 2.8	8.93 .27	48.5 0.9	29.89 .69	24.5 2.8	18.73 .27	22.2 1.8
16.6	21.73 .33	21.4 3.0	9.18 .24	47.8 0.5	30.54 .61	27.5 3.1	18.99 .24	23.9 1.6
26.6	22.03 .28	24.6 3.2	9.41 .21	47.4 +0.2	31.10 .51	30.7 3.3	19.22 .21	25.5 1.4
Sept. 5.6	22.28 +.22	27.8 +3.3	9.60 +.17	47.4 −0.2	31.56 +.40	34.2 +3.5	19.41 +.18	26.8 +1.2
15.6	22.48 .16	31.1 3.2	9.75 .13	47.7 0.5	31.90 .28	37.8 3.7	19.58 .15	27.9 1.0
25.5	22.61 .11	34.4 3.2	9.86 .09	48.4 0.8	32.14 .17	41.5 3.7	19.70 .11	28.8 0.8
Oct. 5.5	22.69 +.05	37.6 3.1	9.94 .05	49.2 1.0	32.25 +.05	45.2 3.7	19.80 .08	29.5 0.5
15.5	22.71 .00	40.6 2.9	9.97 +.02	50.3 1.1	32.24 −.06	48.9 3.6	19.86 .05	29.9 0.3
25.5	22.68 −.05	43.5 +2.7	9.98 −.01	51.5 −1.2	32.12 −.18	52.4 +3.4	19.89 +.02	30.2 +0.1
Nov. 4.4	22.60 .10	46.1 2.4	9.95 .04	52.8 1.3	31.88 .29	55.7 3.1	19.89 −.01	30.2 0.0
14.4	22.48 .15	48.4 2.0	9.90 .06	54.1 1.3	31.54 .39	58.7 2.8	19.87 .03	30.1 −0.2
24.4	22.31 .19	50.2 1.6	9.83 .08	55.4 1.2	31.10 .49	61.3 2.4	19.83 .05	29.9 0.3
Dec. 4.3	22.10 .23	51.8 1.2	9.74 .10	56.5 1.1	30.56 .57	63.4 1.9	19.76 .07	29.5 0.4
14.3	21.86 −.25	52.7 +0.7	9.64 −.11	57.5 −0.9	29.95 −.64	65.0 +1.3	19.68 −.08	29.0 −0.5
24.3	21.60 .27	53.2 +0.2	9.52 .11	58.3 0.7	29.28 .70	66.1 0.7	19.59 .10	28.5 0.6
34.3	21.32 −.28	53.2 −0.3	9.41 −.12	58.9 −0.5	28.58 −.72	66.5 +0.1	19.48 −.11	27.9 −0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		θ¹ Ceti.		38 Cassiopeæ.		η Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 3	° ′ +35 2	h m 1 18	° ′ − 8 44	h m 1 23	° ′ +69 41	h m 1 25	° ′ +14 46
	s	″	s	″	s	″	s	″
(Dec.30.3)	36.82 −.15	37.8 −0.2	33.81 −.11	55.1 −0.7	6.37 −.49	85.0 +0.8	38.28 −.11	60.1 −0.5
Jan. 9.3	36.66 .16	37.5 0.5	33.70 .12	55.8 0.6	5.86 .52	85.5 +0.2	38.16 .12	59.6 0.6
19.2	36.50 .17	36.8 0.8	33.58 .12	56.3 0.4	5.33 .53	85.5 −0.3	38.04 .13	59.0 0.7
29.2	36.33 .16	35.8 1.1	33.46 .12	56.6 −0.2	4.80 .52	84.9 0.9	37.91 .13	58.3 0.7
Feb. 8.2	36.18 .15	34.5 1.3	33.34 .11	56.8 0.0	4.28 .49	83.7 1.4	37.78 .12	57.6 0.7
18.1	36.04 −.13	33.1 −1.5	33.23 −.10	56.7 +0.2	3.81 −.44	82.0 −1.9	37.67 −.11	56.8 −0.7
28.1	35.92 .10	31.6 1.6	33.14 .08	56.4 0.4	3.40 .36	80.0 2.2	37.57 .09	56.1 0.7
Mar. 10.1	35.84 .06	29.9 1.6	33.08 .05	55.8 0.7	3.08 .27	77.6 2.5	37.49 .06	55.5 0.6
20.1	35.80 −.02	28.4 1.5	33.04 −.02	55.0 0.9	2.86 .17	75.0 2.7	37.45 −.03	55.0 0.4
30.0	35.81 +.03	26.9 1.4	33.04 +.02	54.0 1.1	2.75 −.05	72.2 2.7	37.44 +.01	54.6 −0.2
Apr. 9.0	35.87 +.08	25.6 −1.2	33.07 +.06	52.8 +1.4	2.76 +.07	69.5 −2.7	37.47 +.06	54.4 0.0
19.0	35.98 .14	24.5 0.9	33.15 .10	51.3 1.6	2.89 .19	66.9 2.5	37.55 .11	54.5 +0.2
29.0	36.15 .19	23.7 0.6	33.28 .14	49.6 1.8	3.14 .31	64.5 2.2	37.68 .15	54.9 0.5
May 8.9	36.36 .24	23.3 −0.2	33.44 .18	47.7 2.0	3.51 .42	62.4 1.9	37.85 .19	55.5 0.7
18.9	36.62 .28	23.2 +0.1	33.65 .22	45.7 2.1	3.97 .51	60.7 1.5	38.06 .23	56.4 1.0
28.9	36.92 +.31	23.5 +0.5	33.89 +.25	43.5 +2.2	4.53 +.59	59.4 −1.0	38.31 +.26	57.5 +1.3
June 7.8	37.25 .34	24.2 0.9	34.16 .28	41.3 2.2	5.15 .65	58.6 −0.5	38.58 .29	58.9 1.5
17.8	37.60 .36	25.3 1.2	34.45 .30	39.0 2.2	5.83 .69	58.3 0.0	38.89 .31	60.4 1.7
27.8	37.96 .37	26.7 1.5	34.76 .31	36.9 2.1	6.54 .72	58.6 +0.5	39.20 .32	62.2 1.8
July 7.8	38.33 .36	28.4 1.8	35.08 .32	34.8 2.0	7.26 .72	59.3 1.0	39.53 .32	64.1 1.9
17.7	38.69 +.35	30.4 +2.0	35.40 +.31	32.8 +1.8	7.99 +.71	60.6 +1.5	39.85 +.32	66.0 +2.0
27.7	39.04 .33	32.5 2.2	35.71 .30	31.1 1.6	8.69 .69	62.3 1.9	40.17 .31	68.0 2.0
Aug. 6.7	39.36 .31	34.8 2.4	36.00 .28	29.6 1.3	9.36 .64	64.4 2.3	40.47 .29	69.9 1.9
16.6	39.66 .28	37.3 2.5	36.27 .26	28.4 1.0	9.98 .59	66.9 2.6	40.75 .27	71.8 1.8
26.6	39.92 .25	39.7 2.5	36.52 .23	27.5 0.7	10.54 .53	69.7 2.9	41.00 .24	73.6 1.7
Sept. 5.6	40.15 +.21	42.2 +2.5	36.73 +.20	27.0 +0.4	11.03 +.45	72.8 +3.2	41.23 +.21	75.2 +1.5
15.6	40.34 .17	44.7 2.4	36.92 .16	26.7 +0.1	11.44 .37	76.1 3.4	41.42 .18	76.7 1.3
25.5	40.49 .13	47.0 2.3	37.06 .13	26.7 −0.2	11.78 .29	79.5 3.5	41.58 .14	78.0 1.2
Oct. 5.5	40.60 .09	49.2 2.2	37.18 .10	27.0 0.4	12.02 .20	83.0 3.5	41.70 .11	79.0 1.0
15.5	40.68 .06	51.3 2.0	37.26 .06	27.6 0.6	12.18 .11	86.5 3.5	41.79 .06	79.9 0.8
25.5	40.72 +.02	53.2 +1.8	37.30 +.03	28.3 −0.8	12.24 +.02	90.0 +3.4	41.85 +.05	80.6 +0.6
Nov. 4.4	40.72 −.01	54.8 1.5	37.32 .00	29.2 0.9	12.22 −.07	93.3 3.2	41.89 +.02	81.1 0.4
14.4	40.69 .04	56.2 1.3	37.31 −.02	30.2 1.0	12.10 .16	96.4 2.9	41.89 −.01	81.4 0.2
24.4	40.63 .07	57.4 1.0	37.28 .04	31.2 1.0	11.90 .24	99.2 2.6	41.87 .03	81.5 +0.1
Dec. 4.3	40.55 .10	58.2 0.7	37.22 .08	32.2 1.0	11.61 .32	101.6 2.2	41.82 .06	81.5 −0.1
14.3	40.44 −.12	58.7 +0.3	37.15 −.08	33.2 −0.9	11.25 −.39	103.5 +1.7	41.76 −.08	81.3 −0.2
24.3	40.30 .14	58.9 0.0	37.06 .10	34.1 0.8	10.82 .45	105.0 1.2	41.67 .10	81.0 0.4
34.3	40.16 −.15	58.7 −0.2	36.95 −.11	34.8 −0.7	10.34 −.50	105.9 +0.6	41.57 −.11	80.6 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Eridani. (*Achernar.*)		ο Piscium.		β Arietis.		50 Cassiopeæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 1 33	° ′ −57 47	h m 1 39	° ′ + 8 36	h m 1 48	° ′ +20 16	h m 1 54	° ′ +71 53
	s	″	s	″	s	″	s	″
(Dec. 30.3)	39.08 −.31	48.8 −0.7	37.61 −.10	28.2 −0.5	36.45 −.11	30.6 −0.3	7.35 −.52	49.8 +1.2
Jan. 9.3	38.76 .32	49.2 −0.1	37.50 .11	27.7 0.6	36.34 .12	30.2 0.4	6.80 .57	50.8 0.7
19.2	38.44 .32	49.1 +0.5	37.38 .12	27.1 0.6	36.21 .13	29.7 0.6	6.21 .60	51.2 +0.1
29.2	38.12 .31	48.3 1.0	37.26 .13	26.5 0.6	36.07 .14	29.1 0.7	5.60 .61	51.0 −0.5
Feb. 8.2	37.82 .29	47.0 1.5	37.13 .12	26.0 0.5	35.92 .14	28.4 0.8	4.99 .59	50.3 1.0
18.1	37.54 −.26	45.3 +2.0	37.01 −.11	25.4 −0.5	35.79 −.13	27.6 −0.8	4.42 −.55	49.0 −1.5
28.1	37.29 .22	43.0 2.4	36.91 .09	25.0 0.4	35.67 .11	26.8 0.8	3.90 .48	47.3 1.9
Mar. 10.1	37.09 .18	40.4 2.8	36.82 .07	24.7 0.2	35.57 .08	25.9 0.8	3.46 .39	45.2 2.3
20.1	36.94 .12	37.4 3.1	36.77 −.04	24.5 −0.1	35.50 .05	25.2 0.7	3.13 .28	42.7 2.5
30.0	36.84 −.06	34.1 3.4	36.75 .00	24.5 +0.1	35.47 −.01	24.6 0.6	2.91 .15	40.1 2.7
Apr. 9.0	36.81 .00	30.6 +3.5	36.77 +.04	24.7 +0.3	35.48 +.03	24.1 −0.4	2.82 −.02	37.4 −2.7
19.0	36.85 +.07	27.1 3.6	36.83 .08	25.2 0.6	35.54 .08	23.8 −0.1	2.87 +.12	34.7 2.6
29.0	36.96 .14	23.4 3.7	36.94 .13	25.9 0.8	35.64 .13	23.8 +0.1	3.06 .25	32.1 2.4
May 8.9	37.14 .21	19.8 3.6	37.09 .17	26.8 1.0	35.80 .18	24.0 0.4	3.38 .38	29.8 2.2
18.9	37.39 .28	16.2 3.4	37.28 .21	28.0 1.3	35.99 .22	24.5 0.6	3.82 .49	27.8 1.8
28.9	37.70 +.34	12.9 +3.2	37.52 +.25	29.4 +1.5	36.23 +.25	25.3 +0.9	4.36 +.59	26.2 −1.4
June 7.8	38.07 .39	9.7 3.0	37.78 .28	30.9 1.7	36.50 .28	26.3 1.2	5.00 .68	25.0 1.0
17.8	38.48 .43	7.0 2.6	38.07 .30	32.7 1.8	36.80 .31	27.6 1.4	5.72 .74	24.2 −0.5
27.8	38.94 .46	4.6 2.2	38.38 .31	34.5 1.9	37.12 .33	29.1 1.6	6.48 .78	24.0 0.0
July 7.8	39.41 .48	2.6 1.7	38.70 .32	36.4 1.9	37.45 .33	30.8 1.7	7.28 .80	24.3 +0.5
17.7	39.90 +.48	1.2 +1.2	39.02 +.32	38.4 +1.9	37.78 +.33	32.6 +1.8	8.09 +.81	25.1 +1.0
27.7	40.39 .48	0.3 0.6	39.33 .31	40.3 1.9	38.11 .32	34.4 1.9	8.89 .79	26.3 1.5
Aug. 6.7	40.87 .46	0.0 +0.1	39.63 .29	42.1 1.8	38.43 .30	36.3 1.9	9.67 .76	28.0 1.9
16.6	41.31 .43	0.2 −0.5	39.92 .27	43.8 1.6	38.72 .28	38.2 1.9	10.41 .71	30.1 2.3
26.6	41.72 .39	1.0 1.1	40.17 .24	45.4 1.4	39.00 .26	40.1 1.8	11.10 .65	32.6 2.6
Sept. 5.6	42.08 +.33	2.4 −1.6	40.40 +.21	46.7 +1.2	39.24 +.23	41.9 +1.7	11.72 +.58	35.4 +2.9
15.6	42.39 .27	4.2 2.0	40.60 .18	47.8 1.0	39.46 .20	43.5 1.6	12.27 .51	38.5 3.2
25.5	42.63 .20	6.4 2.4	40.78 .15	48.8 0.8	39.65 .17	45.0 1.4	12.73 .42	41.7 3.3
Oct. 5.5	42.80 .13	9.0 2.7	40.91 .12	49.5 0.6	39.80 .14	46.3 1.2	13.11 .33	45.2 3.4
15.5	42.90 +.06	11.8 2.8	41.02 .09	49.9 0.4	39.92 .11	47.5 1.0	13.38 .23	48.6 3.5
25.5	42.93 .00	14.6 −2.9	41.09 +.06	50.2 +0.2	40.01 +.07	48.5 +0.8	13.56 +.12	52.1 +3.5
Nov. 4.4	42.89 −.06	17.5 2.8	41.14 +.03	50.3 0.0	40.07 .04	49.3 0.7	13.63 +.02	55.5 3.3
14.4	42.79 .13	20.2 2.6	41.15 .00	50.3 −0.1	40.09 +.01	49.9 0.5	13.60 −.09	58.6 3.1
24.4	42.63 .18	22.7 2.3	41.14 −.02	50.1 0.2	40.09 −.02	50.3 0.3	13.46 .19	61.8 2.9
Dec. 4.3	42.42 .23	24.9 1.9	41.11 .05	49.8 0.3	40.06 .04	50.6 +0.2	13.21 .29	64.5 2.5
14.3	42.17 −.27	26.7 −1.5	41.05 −.07	49.4 −0.4	40.01 −.07	50.7 0.0	12.88 −.38	66.9 +2.1
24.3	41.88 .29	27.9 1.0	40.98 .09	48.9 0.5	39.93 .09	50.6 −0.1	12.45 .46	68.8 1.6
34.3	41.58 −.31	28.6 −0.5	40.88 −.11	48.4 −0.6	39.83 −.11	50.4 −0.3	11.94 −.53	70.1 +1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		ξ¹ Ceti.		ι Cassiopeæ.		ξ² Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	2h 1m	+22° 56′	2h 7m	+ 8° 20′	2h 20m	+66° 54′	2h 22m	+ 7° 58′
	s	″	s	″	s	″	s	″
(Dec. 30.3)	1.14 −.11	50.0 −0.2	12.87 −.09	3.4 −0.5	4.72 −.36	54.9 +1.3	21.41 −.08	13.3 −0.6
Jan. 9.3	1.02 .12	49.7 0.3	12.77 .11	2.9 0.5	4.34 .40	56.1 0.9	21.31 .10	12.8 0.5
19.2	0.89 .14	49.3 0.5	12.65 .12	2.4 0.5	3.91 .44	56.8 +0.4	21.20 .12	12.3 0.5
29.2	0.74 .15	48.8 0.6	12.52 .13	1.8 0.5	3.45 .46	56.8 −0.2	21.07 .13	11.8 0.5
Feb. 8.2	0.59 .15	48.0 0.7	12.38 .13	1.3 0.5	2.98 .46	56.4 0.7	20.93 .14	11.3 0.4
18.2	0.45 −.14	47.2 −0.8	12.25 −.13	0.9 −0.4	2.53 −.44	55 4 −1.2	20.79 −.13	10.8 −0.4
28.2	0.32 .12	46.4 0.9	12.13 .11	0.5 0.3	2.10 .40	54.0 1.6	20.66 .12	10.5 0.3
Mar. 10.1	0.20 .10	45.5 0.9	12.02 .09	0.2 0.2	1.73 .34	52.2 2.0	20.55 .10	10.3 −0.2
20.1	0.12 .07	44.7 0.8	11.94 .06	0.1 −0.1	1.43 .26	50.0 2.3	20.46 .07	10.2 0.0
30.1	0.08 −.02	43.9 0.7	11.90 −.03	0.1 +0.1	1.21 .16	47.6 2.4	20.40 −.04	10.2 +0.1
Apr. 9.1	0.08 +.02	43.3 −0.5	11.89 +.01	0.3 +0.3	1.10 −.06	45.1 −2.5	20.37 .00	10.5 +0.3
19.0	0.12 .07	42.9 0.3	11.93 .06	0.8 0.6	1.09 +.05	42.6 2.5	20.40 +.04	10.9 0.5
29.0	0.22 .12	42.6 −0.1	12.01 .10	1.4 0.8	1.20 .16	40.2 2.3	20.46 .09	11.6 0.8
May 9.0	0.36 .17	42.7 +0.2	12.13 .15	2.3 1.0	1.41 .26	37.9 2.1	20.58 .14	12.4 1.0
18.9	0.55 .21	43.0 0.4	12.30 .19	3.4 1.2	1.73 .36	35.9 1.8	20.73 .18	13.5 1.2
28.9	0.78 +.25	43.6 +0.7	12.52 +.23	4.7 +1.4	2.14 +.45	34.3 −1.4	20.93 +.22	14.8 +1.4
June 7.9	1.05 .28	44.4 1.0	12.76 .26	6.2 1.6	2.63 .52	33.0 1.0	21.17 .25	16.3 1.6
17.9	1.35 .31	45.5 1.2	13.04 .29	7.9 1.7	3.18 .58	32.2 0.6	21.44 .28	18.0 1.7
27.8	1.67 .33	46.9 1.4	13.34 .30	9.7 1.8	3.79 .63	31.8 −0.2	21.72 .30	19.7 1.8
July 7.8	2.00 .34	48.4 1.6	13.65 .31	11.5 1.9	4.44 .66	31.9 +0.3	22.03 .31	21.5 1.8
17.8	2.34 +.34	50.1 +1.7	13.96 +.32	13.4 +1.9	5.10 +.67	32.4 +0.8	22.35 +.32	23.3 +1.8
27.7	2.67 .33	51.9 1.8	14.28 .31	15.2 1.8	5.77 .66	33.4 1.2	22.66 .31	25.1 1.7
Aug. 6.7	3.00 .32	53.8 1.9	14.59 .30	17.0 1.7	6.43 .65	34.8 1.6	22.97 .30	26.8 1.6
16.7	3.30 .30	55.6 1.9	14.88 .28	18.6 1.6	7.07 .62	36.6 2.0	23.27 .30	28.4 1.5
26.7	3.59 .27	57.5 1.8	15.15 .26	20.1 1.4	7.67 .58	38.8 2.3	23.55 .27	29.9 1.3
Sept. 5.6	3.85 +.25	59.3 +1.7	15.40 +.24	21.4 +1.2	8.23 +.53	41.3 +2.6	23.80 +.25	31.1 +1.1
15.6	4.08 .22	61.0 1.6	15.63 .21	22.5 1.0	8 73 .47	44.0 2.9	24.04 .22	32.1 0.9
25.6	4.28 .18	62.6 1.5	15.82 .18	23.3 0.7	9.18 .42	47.0 3.0	24.25 .19	33.0 0.7
Oct. 5.6	4.45 .15	64.0 1.4	15.98 .15	24.0 0.5	9.55 .34	50.1 3.2	24.42 .16	33.5 0.5
15.5	4.59 .12	65.3 1.2	16.12 .12	24.4 0.3	9.85 .26	53.3 3.2	24.57 .13	33.9 0.3
25.5	4.69 +.09	66.4 +1.0	16.22 +.09	24.6 +0.1	10.08 +.19	56.6 +3.2	24.69 +.10	34.1 +0.1
Nov. 4.5	4.76 .06	67.4 0.9	16.29 .06	24.7 0.0	10.22 .10	59.8 3.1	24.78 .07	34.1 −0.1
14.4	4.80 +.03	68.2 0.7	16.34 +.03	24.6 −0.2	10.29 +.02	62.9 3.0	24.84 .04	34.0 0.2
24.4	4.82 .00	68.8 0.5	16.35 .00	24.3 0.3	10.26 −.07	65.8 2.8	24.87 +.02	33.7 0.3
Dec. 4.4	4.80 −.03	69.2 0.3	16.34 −.03	24.0 0.4	10.15 .15	68.5 2.5	24.87 −.01	33.3 0.4
14.4	4.75 −.06	69.4 +0.1	16.30 −.05	23.6 −0.4	9.96 −.23	70.8 +2.2	24.84 −.04	32.9 −0.5
24.3	4.68 .09	69.5 0.0	16.24 .07	23.1 0.5	9.69 .30	72.8 1.7	24.80 .07	32.4 0.5
34.3	4.58 −.11	69.4 −0.2	16.15 −.09	22.6 −0.5	9.36 −.37	74.3 +1.2	24.71 −.09	31.9 −0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Ceti.		α Ceti.		48 Cephei (H.)		ζ Arietis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 2 37	° ′ + 2 46	h m 2 56	° ′ + 3 39	h m 3 6	° ′ +77 19	h m 3 8	° ′ +20 38
	s	″	s	″	s	″	s	″
(Dec. 30.3	38.82 −.09	29.9 −0.7	34.65 −.07	38.8 −0.7	31.12 −.59	72.3 +2.2	37.92 −.07	25.8 0.0
Jan. 9.3	38.73 .10	29.2 0.6	34.57 .10	38.2 0.6	30.48 .69	74.3 1.7	37.84 .10	25.7 −0.1
19.2	38.62 .12	28.6 0.6	34.46 .12	37.6 0.5	29.73 .80	75.8 1.2	37.73 .12	25.6 0.2
29.2	38.49 .13	28.1 0.5	34.34 .13	37.1 0.5	28.89 .87	76.7 +0.6	37.60 .14	25.3 0.3
Feb. 8.2	38.35 .14	27.7 0.4	34.19 .14	36.7 0.4	28.00 .90	77.0 0.0	37.44 .16	24.9 0.4
18.2	38.21 −.14	27.4 −0.3	34.05 −.15	36.4 −0.3	27.09 −.89	76.8 −0.6	37.28 −.16	24.5 −0.5
28.2	38.07 .13	27.2 −0.1	33.90 .14	36.2 −0.1	26.21 .85	75.9 1.1	37.12 .16	24.0 0.5
Mar. 10.1	37.95 .11	27.2 0.0	33.76 .13	36.1 0.0	25.39 .76	74.6 1.6	36.97 .14	23.4 0.5
20.1	37.84 .09	27.3 +0.2	33.65 .10	36.2 +0.2	24.68 .65	72.7 2.0	36.84 .12	22.9 0.5
30.1	37.77 .06	27.6 0.4	33.56 .07	36.4 0.4	24.10 .50	70.5 2.3	36.74 .09	22.4 0.4
Apr. 9.1	37.74 −.02	28.1 +0.6	33.51 −.03	36.9 +0.6	23.68 −.33	68.0 −2.6	36.68 −.04	22.0 −0.3
19.0	37.74 +.03	28.9 0.8	33.50 +.01	37.6 0.8	23.44 −.15	65.4 2.7	36.65 .00	21.7 0.2
29.0	37.79 .08	29.8 1.0	33.53 .05	38.4 1.0	23.39 +.04	62.6 2.7	36.68 +.05	21.6 −0.1
May 9.0	37.89 .12	30.9 1.2	33.61 .10	39.5 1.2	23.53 .26	59.9 2.6	36.75 .10	21.6 +0.1
19.0	38.03 .16	32.3 1.4	33.73 .14	40.7 1.3	23.85 .46	57.4 2.4	36.88 .15	21.8 0.3
28.9	38.21 +.20	33.8 +1.6	33.90 +.18	42.2 +1.5	24.36 +.58	55.0 −2.2	37.05 +.19	22.2 +0.5
June 7.9	38.43 .24	35.5 1.7	34.10 .22	43.8 1.7	25.02 .74	53.0 1.9	37.26 .23	22.9 0.8
17.9	38.68 .27	37.3 1.8	34.34 .26	45.5 1.8	25.83 .87	51.3 1.5	37.51 .26	23.8 1.0
27.8	38.96 .29	39.2 1.9	34.61 .28	47.3 1.8	26.75 .97	50.0 1.0	37.79 .29	24.8 1.1
July 7.8	39.26 .30	41.1 1.9	34.90 .29	49.1 1.8	27.77 1.06	49.2 0.6	38.09 .31	26.0 1.3
17.8	39.56 +.31	43.0 +1.8	35.20 +.30	50.9 +1.8	28.86 +1.11	48.8 −0.1	38.41 +.32	27.4 +1.4
27.7	39.87 .31	44.7 1.7	35.51 .31	52.7 1.7	29.99 1.14	48.9 +0.3	38.74 .33	28.8 1.4
Aug. 6.7	40.18 .30	46.4 1.6	35.82 .31	54.3 1.6	31.15 1.15	49.5 0.8	39.07 .33	30.2 1.5
16.7	40.48 .29	47.9 1.4	36.12 .30	55.8 1.4	32.30 1.13	50.6 1.3	39.39 .32	31.7 1.5
26.7	40.76 .27	49.2 1.2	36.42 .28	57.1 1.2	33.42 1.10	52.1 1.7	39.70 .31	33.2 1.4
Sept. 5.6	41.03 +.25	50.2 +0.9	36.69 +.26	58.1 +0.9	34.49 +1.04	53.9 +2.1	40.00 +.29	34.5 +1.3
15.6	41.27 .23	51.0 0.7	36.94 .24	58.9 0.6	35.50 .97	56.2 2.4	40.28 .27	35.8 1.2
25.6	41.49 .20	51.6 0.4	37.18 .22	59.5 0.4	36.42 .87	58.8 2.7	40.54 .24	37.0 1.1
Oct. 5.6	41.68 .17	51.8 +0.2	37.38 .19	59.8 +0.2	37.25 .76	61.7 3.0	40.77 .22	38.1 1.0
15.5	41.84 .15	51.9 −0.1	37.56 .16	59.8 0.0	37.96 .64	64.8 3.2	40.97 .19	39.0 0.8
25.5	41.97 +.12	51.7 −0.3	37.71 +.14	59.7 −0.2	38.54 +.51	68.1 +3.3	41.15 +.16	39.8 +0.7
Nov. 4.5	42.07 .09	51.4 0.4	37.83 .11	59.3 0.4	38.97 .36	71.5 3.4	41.29 .13	40.5 0.6
14.4	42.14 .06	50.9 0.5	37.92 .08	58.9 0.5	39.25 .20	74.9 3.4	41.41 .10	41.0 0.5
24.4	42.18 +.03	50.3 0.6	37.98 .05	58.3 0.6	39.36 +.02	78.3 3.3	41.49 .07	41.4 0.4
Dec. 4.4	42.19 .00	49.6 0.7	38.01 +.02	57.6 0.7	39.30 −.14	81.5 3.1	41.54 +.03	41.8 0.3
14.4	42.17 −.03	48.9 −0.7	38.01 −.02	56.9 −0.7	39.08 −.31	84.6 +2.9	41.56 .00	41.9 +0.2
24.3	42.13 .06	48.2 0.7	37.98 .05	56.2 0.7	38.69 .47	87.2 2.5	41.53 −.04	42.0 +0.1
34.3	42.06 −.09	47.5 −0.6	37.91 −.08	55.6 −0.6	38.15 −.62	89.5 +2.0	41.47 −.08	42.0 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Persei.		ε Eridani.		δ Persei.		η Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 16	+49° 28′	h m 3 27	− 9° 49′	h m 3 35	+47° 26′	h m 3 40	+23° 46′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	32.41 −.13	29.8 +1.2	47.72 −.07	44.7 −1.2	9.88 −.09	25.7 +1.2	60.17 −.05	5.6 +0.2
Jan. 9.3	32.27 .16	30.9 0.9	47.64 .09	45.8 1.0	9.76 .13	26.8 1.0	60.11 .08	5.8 +0.1
19.3	32.08 .20	31.7 0.6	47.54 .12	46.7 0.8	9.61 .17	27.7 0.7	60.02 .11	5.8 0.0
29.3	31.86 .23	32.1 +0.2	47.41 .14	47.4 0.6	9.41 .21	28.2 +0.4	59.89 .14	5.8 −0.1
Feb. 8.2	31.62 .25	32.1 −0.2	47.26 .15	47.9 0.3	9.18 .24	28.4 0.0	59.74 .16	5.6 0.2
18.2	31.36 −.26	31.7 −0.5	47.10 −.16	48.1 −0.1	8.94 −.25	28.1 −0.4	59.57 −.17	5.3 −0.3
28.2	31.10 .25	31.0 0.9	46.93 .16	48.1 +0.2	8.68 .24	27.6 0.7	59.40 .17	4.9 0.4
Mar. 10.2	30.86 .23	29.9 1.2	46.78 .15	47.8 0.4	8.44 .23	26.8 1.0	59.23 .16	4.4 0.5
20.1	30.65 .19	28.6 1.4	46.63 .13	47.3 0.7	8.23 .20	25.6 1.2	59.08 .14	3.9 0.5
30.1	30.48 .14	27.1 1.6	46.51 .10	46.4 0.9	8.05 .16	24.3 1.4	58.95 .11	3.4 0.5
Apr. 9.1	30.36 −.09	25.4 −1.7	46.43 −.07	45.4 +1.2	7.92 −.10	22.8 −1.5	58.85 −.07	2.9 −0.5
19.1	30.30 −.02	23.7 1.7	46.38 −.03	44.1 1.4	7.84 −.04	21.3 1.6	58.80 −.03	2.5 0.4
29.0	30.31 +.05	22.0 1.6	46.37 +.01	42.5 1.6	7.83 +.02	19.7 1.5	58.80 +.02	2.1 0.3
May 9.0	30.39 .11	20.4 1.5	46.40 .06	40.8 1.8	7.88 .08	18.2 1.4	58.84 .07	1.9 −0.1
19.0	30.54 .18	19.0 1.3	46.49 .11	38.8 2.0	8.00 .15	16.8 1.3	58.93 .12	1.9 +0.1
28.9	30.75 +.24	17.8 −1.1	46.62 +.15	36.8 +2.1	8.19 +.21	15.7 −1.0	59.08 +.17	2.1 +0.2
June 7.9	31.02 .30	16.9 0.8	46.79 .19	34.6 2.2	8.43 .27	14.7 0.8	59.27 .21	2.4 0.4
17.9	31.35 .35	16.2 0.5	47.00 .22	32.3 2.2	8.73 .32	14.1 0.5	59.50 .24	2.9 0.6
27.9	31.72 .38	15.9 −0.2	47.24 .25	30.0 2.2	9.07 .36	13.7 −0.2	59.76 .28	3.6 0.8
July 7.8	32.12 .41	15.9 +0.2	47.50 .27	27.8 2.1	9.45 .39	13.6 +0.1	60.05 .30	4.5 1.0
17.8	32.54 +.43	16.3 +0.5	47.79 +.29	25.8 +2.0	9.85 +.41	13.8 +0.4	60.36 +.32	5.6 +1.1
27.8	32.98 .44	17.0 0.8	48.08 .30	23.9 1.8	10.27 .42	14.3 0.6	60.69 .33	6.7 1.2
Aug. 6.8	33.43 .44	17.9 1.1	48.39 .30	22.2 1.6	10.70 .43	15.1 0.9	61.02 .33	7.9 1.2
16.7	33.87 .43	19.2 1.4	48.69 .29	20.7 1.3	11.13 .43	16.1 1.2	61.35 .33	9.1 1.3
26.7	34.30 .42	20.7 1.6	48.98 .29	19.7 0.9	11.55 .42	17.4 1.4	61.68 .32	10.4 1.2
Sept. 5.7	34.71 +.40	22.4 +1.8	49.26 +.28	18.9 +0.6	11.96 +.40	18.9 +1.6	62.00 +.31	11.6 +1.2
15.6	35.10 .37	24.2 2.0	49.53 .26	18.5 +0.2	12.35 .38	20.5 1.7	62.30 .29	12.8 1.1
25.6	35.46 .34	26.2 2.1	49.78 .23	18.5 −0.2	12.72 .35	22.3 1.8	62.58 .27	13.9 1.1
Oct. 5.6	35.78 .31	28.4 2.2	50.00 .21	18.9 0.5	13.06 .32	24.2 1.9	62.84 .25	14.9 1.0
15.6	36.07 .27	30.6 2.2	50.20 .18	19.5 0.8	13.36 .29	26.2 2.0	63.08 .23	15.8 0.9
25.5	36.32 +.23	32.8 +2.3	50.38 +.16	20.5 −1.1	13.63 +.25	28.2 +2.0	63.30 +.20	16.7 +0.8
Nov. 4.5	36.53 .18	35.1 2.2	50.52 .13	21.6 1.3	13.86 .20	30.3 2.0	63.48 .17	17.4 0.7
14.5	36.69 .13	37.3 2.2	50.63 .10	23.0 1.4	14.04 .16	32.3 2.0	63.63 .14	18.0 0.6
24.5	36.80 .08	39.4 2.1	50.71 .06	24.4 1.5	14.18 .11	34.3 1.9	63.75 .10	18.6 0.5
Dec. 4.4	36.86 +.03	41.4 1.9	50.76 +.03	25.9 1.5	14.26 .06	36.2 1.8	63.84 .06	19.1 0.4
14.4	36.86 −.02	43.2 +1.7	50.77 .00	27.3 −1.4	14.30 +.01	37.9 +1.6	63.88 +.03	19.4 +0.3
24.4	36.81 .08	44.8 1.4	50.75 −.03	28.7 1.3	14.28 −.05	39.5 1.4	63.89 −.01	19.7 0.2
34.4	36.70 −.13	46.1 +1.1	50.69 −.07	29.9 −1.1	14.20 −.10	40.8 +1.2	63.86 −.05	19.9 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Persei.		γ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 47	° ′ +31 33	h m 3 52	° ′ −13 48	h m 4 13	° ′ +15 21	h m 4 22	° ′ +18 56
	s	″	s	″	s	″	s	″
(Dec.30.4)	16.75 −.05	37.6 +0.6	56.86 −.06	74.4 −1.5	35.46 −.01	51.0 −0.2	15.15 −.01	18.8 0.0
Jan. 9.3	16.69 .08	38.1 0.4	56.80 .06	75.8 1.2	35.43 .05	50.8 0.2	15.13 .05	18.8 0.0
19.3	16.59 .11	38.4 0.2	56.70 .11	76.9 1.0	35.36 .09	50.6 0.2	15.06 .08	18.7 −0.1
29.3	16.45 .15	38.6 +0.1	56.57 .14	77.8 0.7	35.26 .12	50.3 0.2	14.96 .12	18.6 0.1
Feb. 8.3	16.28 .17	38.6 −0.1	56.42 .16	78.4 0.5	35.12 .14	50.1 0.2	14.83 .15	18.5 0.1
18.2	16.10 −.19	38.4 −0.3	56.26 −.17	78.8 −0.2	34.97 −.16	49.9 −0.2	14.67 −.16	18.3 −0.2
28.2	15.91 .19	38.0 0.5	56.08 .17	78.8 +0.1	34.80 .17	49.7 0.2	14.50 .17	18.1 0.2
Mar. 10.2	15.73 .18	37 4 0.6	55.91 .16	78.5 0.4	34.63 .16	49.4 0.2	14.33 .17	17.9 0.2
20.2	15.56 .16	36.7 0.7	55.75 .15	77.9 0.7	34.47 .15	49.3 0.2	14.16 .16	17.7 0.2
30.1	15.41 .13	36.0 0.8	55.62 .12	77.1 1.0	34.33 .13	49.1 −0.1	14.01 .13	17.4 0.2
Apr. 9.1	15.31 −.08	35.2 −0.8	55.51 −.09	75.9 +1.3	34.22 −.09	49.0 0.0	13.90 −.10	17.2 −0.2
19.1	15.24 −.04	34.4 0.8	55.43 .06	74.5 1.5	34.15 .05	49.0 +0.1	13.81 .06	17.1 −0.1
29.0	15.23 +.01	33.6 0.7	55.40 −.01	72.8 1.8	34.11 −.01	49.2 0.2	13.77 −.02	17.0 0.0
May 9.0	15.27 .06	33.0 0.6	55.41 +.03	71.0 2.0	34.12 +.04	49.4 0.3	13.77 +.03	17.1 +0.1
19.0	15.36 .12	32.5 0.4	55.47 .06	68.9 2.1	34.18 .06	49.8 0.5	13.83 .08	17.3 0.3
29.0	15.51 +.17	32.2 −0.2	55.57 +.12	66.7 +2.3	34.29 +.13	50.4 +0.6	13.93 +.12	17.6 +0.4
June 7.9	15.70 .21	32.0 0.0	55.72 .17	64.3 2.4	34.44 .17	51.1 0.8	14.07 .17	18.1 0.5
17.9	15.94 .25	32.1 +0.2	55.90 .21	62.0 2.4	34.63 .21	52.0 0.9	14.26 .21	18.7 0.7
27.9	16.21 .30	32.4 0.4	56.13 .24	59.6 2.3	34.86 .24	53.0 1.0	14.48 .24	19.4 0.8
July 7.9	16.52 .32	32.9 0.6	56.38 .26	57.3 2.2	35.11 .27	54.0 1.1	14.74 .27	20.3 0.9
17.8	16.85 +.34	33.6 +0.8	56.65 +.28	55.1 +2.1	35.39 +.29	55.2 +1.2	15.02 +.29	21.3 +1.0
27.8	17.19 .35	34.4 0.9	56.94 .29	53.1 1.9	35.69 .30	56.4 1.2	15.32 .31	22.3 1.0
Aug. 6.8	17.54 .35	35.4 1.0	57.24 .30	51.3 1.6	36.00 .31	57.6 1.2	15.63 .32	23.3 1.0
16.7	17.90 .36	36.5 1.1	57.55 .30	49.9 1.3	36.31 .31	58.7 1.1	15.95 .32	24.4 1.0
26.7	18.25 .34	37.7 1.2	57.85 .29	48.8 0.9	36.62 .31	59.8 1.0	16.27 .32	25.4 1.0
Sept. 5.7	18.59 +.33	39.0 +1.3	58.14 +.29	48.1 +0.5	36.93 +.30	60.7 +0.9	16.59 +.31	26.3 +0.9
15.7	18.91 .31	40.3 1.3	58.42 .27	47.8 +0.1	37.23 .29	61.6 0.8	16.89 .30	27.1 0.8
25.6	19.22 .29	41.5 1.3	58.68 .25	47.8 −0.2	37.52 .28	62.3 0.6	17.19 .29	27.8 0.7
Oct. 5.6	19.50 .27	42.8 1.2	58.93 .23	48.3 0.6	37.79 .26	62.8 0.4	17.47 .27	28.4 0.5
15.6	19.77 .25	44.0 1.2	59.15 .21	49.2 1.0	38.04 .24	63.2 0.3	17.74 .25	28.9 0.4
25.6	20.00 +.22	45.2 +1.2	59.35 +.18	50.3 −1.3	38.27 +.22	63.4 +0.2	17.98 +.23	29.3 +0.3
Nov. 4.5	20.20 .19	46.4 1.1	59.51 .15	51.7 1.5	38.48 .19	63.5 +0.1	18.20 .20	29.6 0.2
14.5	20.37 .16	47.5 1.1	59.65 .12	53.3 1.7	38.66 .16	63.5 0.0	18.39 .17	29.7 0.1
24.5	20.51 .12	48.5 1.0	59.75 .09	55.0 1.7	38.80 .13	63.4 −0.1	18.55 .14	29.8 +0.1
Dec. 4.4	20.60 .07	49.4 0.9	59.82 .05	56.8 1.7	38.92 .10	63.3 0.2	18.67 .11	29.9 0.0
14.4	20.66 +.03	50.2 +0.8	59.86 +.02	58.6 −1.7	38.99 +.06	63.2 −0.2	18.76 +.06	29.9 0.0
24.4	20.67 −.01	51.0 0.7	59.85 −.02	60.2 1.6	39.03 +.02	63.0 0.2	18.80 +.02	29.9 0.0
34.4	20.63 −.05	51.6 +0.5	59.81 −.06	61.7 −1.4	39.02 −.02	62.8 −0.2	18.81 −.02	29.9 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Tauri. (*Aldebaran.*)		α Camelopardalis.		ι Aurigæ.		11 Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 29	+16° 17′	h m 4 43	+66° 9′	h m 4 49	+32° 59′	h m 4 58	+15° 15′
	s	″	s	″	s	″	s	″
(Dec. 30.4)	40.05 +.01	23.8 −0.1	13.71 −.08	31.4 +2.5	53.90 +.01	38.2 +0.8	20.58 +.02	7.3 −0.3
Jan. 9.4	40.03 −.04	23.6 0.2	13.61 .15	33.8 2.2	53.89 −.03	39.0 0.7	20.59 −.02	7.1 0.2
19.4	39.97 .08	23.5 0.2	13.40 .25	35.8 1.9	53.84 .08	39.6 0.6	20.55 .06	6.9 0.2
29.4	39.87 .11	23.3 0.2	13.11 .33	37.6 1.5	53.74 .12	40.1 0.4	20.47 .10	6.7 0.2
Feb. 8.3	39.74 .14	23.1 0.2	12.74 .39	38.8 1.0	53.60 .16	40.5 0.3	20.36 .13	6.6 0.1
18.3	39.59 −.18	23.0 −0.2	12.32 −.44	39.7 +0.6	53.42 −.18	40.7 +0.1	20.21 −.15	6.4 −0.1
28.2	39.42 .17	22.8 0.2	11.87 .46	40.0 +0.1	53.23 .20	40.8 −0.1	20.05 .17	6.3 0.1
Mar. 10.2	39.25 .17	22.6 0.2	11.40 .46	39.9 −0.4	53.03 .20	40.6 0.2	19.88 .17	6.2 0.1
20.2	39.09 .16	22.4 0.2	10.95 .43	39.2 0.8	52.83 .19	40.3 0.4	19.70 .18	6.1 −0.1
30.2	38.94 .14	22.3 −0.1	10.54 .39	38.2 1.2	52.65 .17	39.9 0.5	19.54 .15	6.1 0.0
Apr. 9.1	38.82 −.11	22.2 0.0	10.18 −.32	36.7 −1.6	52.50 −.14	39.3 −0.6	19.40 −.12	6.1 0.0
19.1	38.73 .07	22.2 0.0	9.90 .24	34.9 1.9	52.38 .09	38.7 0.7	19.30 .09	6.1 +0.1
29.1	38.68 −.02	22.2 +0.1	9.70 .14	32.9 2.1	52.31 −.05	38.0 0.7	19.23 −.06	6.3 0.2
May 9.1	38.68 +.02	22.4 0.3	9.61 −.04	30.7 2.2	52.28 .00	37.3 0.7	19.20 .00	6.5 0.3
19.0	38.72 .07	22.8 0.4	9.62 +.06	28.5 2.2	52.31 +.05	36.7 0.6	19.22 +.04	6.8 0.4
29.0	38.81 +.11	23.2 +0.5	9.73 +.16	26.3 −2.2	52.39 +.11	36.1 −0.5	19.28 +.09	7.3 +0.5
June 8.0	38.95 .16	23.8 0.7	9.94 .26	24.1 2.1	52.52 .16	35.7 0.4	19.39 .13	7.9 0.6
17.9	39.12 .20	24.5 0.8	10.25 .36	22.1 1.9	52.70 .20	35.4 0.2	19.54 .17	8.6 0.7
27.9	39.34 .23	25.4 0.9	10.65 .44	20.3 1.7	52.93 .24	35.2 −0.1	19.73 .21	9.4 0.8
July 7.9	39.58 .26	26.4 1.0	11.13 .51	18.8 1.4	53.19 .26	35.2 +0.1	19.95 .24	10.3 0.9
17.9	39.86 +.28	27.4 +1.0	11.67 +.57	17.6 −1.1	53.48 +.31	35.3 +0.2	20.20 +.26	11.2 +0.9
27.8	40.15 .30	28.4 1.1	12.26 .61	16.7 0.7	53.80 .33	35.6 0.3	20.48 .28	12.2 1.0
Aug. 6.8	40.45 .31	29.5 1.1	12.90 .65	16.1 −0.4	54.14 .34	36.0 0.5	20.77 .30	13.1 0.9
16.8	40.77 .31	30.6 1.0	13.56 .67	15.9 0.0	54.48 .35	36.5 0.6	21.07 .31	14.0 0.9
26.8	41.08 .31	31.5 0.9	14.24 .68	16.1 +0.3	54.84 .35	37.1 0.6	21.38 .31	14.9 0.8
Sept. 5.7	41.39 +.31	32.4 +0.8	14.92 +.68	16.6 +0.7	55.19 +.35	37.8 +0.7	21.69 +.31	15.6 +0.6
15.7	41.70 .30	33.2 0.7	15.60 .67	17.4 1.0	55.55 .36	38.5 0.7	22.00 .30	16.2 0.5
25.7	41.99 .29	33.8 0.5	16.27 .65	18.6 1.3	55.89 .34	39.3 0.8	22.30 .30	16.6 0.4
Oct. 5.6	42.28 .27	34.3 0.4	16.90 .62	20.1 1.6	56.22 .32	40.0 0.8	22.59 .29	16.9 0.2
15.6	42.54 .25	34.6 0.3	17.50 .58	21.9 1.9	56.54 .30	40.8 0.8	22.87 .27	17.1 +0.1
25.6	42.78 +.23	34.8 +0.1	18.06 +.53	24.0 +2.2	56.84 +.28	41.6 +0.8	23.14 +.26	17.1 0.0
Nov. 4.6	43.00 .21	34.9 0.0	18.56 .46	26.2 2.4	57.11 .26	42.5 0.8	23.38 .23	17.0 −0.1
14.5	43.20 .18	34.9 −0.1	18.98 .39	28.7 2.5	57.36 .23	43.3 0.8	23.60 .21	16.8 0.2
24.5	43.36 .15	34.8 0.1	19.34 .31	31.3 2.6	57.57 .19	44.2 0.8	23.79 .18	16.5 0.3
Dec. 4.5	43.49 .11	34.7 0.1	19.60 .22	34.0 2.7	57.74 .15	45.0 0.8	23.95 .14	16.2 0.3
14.5	43.59 +.07	34.5 −0.2	19.77 +.12	36.7 +2.6	57.86 +.10	45.8 +0.8	24.07 +.10	16.0 −0.3
24.4	43.64 +.03	34.3 0.2	19.83 +.01	39.4 2.5	57.94 +.05	46.6 0.8	24.15 +.06	15.7 0.3
31.4	43.65 −.01	34.2 −0.2	19.79 −.09	41.8 +2.4	57.97 .00	47.4 +0.8	24.19 .00	15.4 −0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		β Tauri.		Groombridge 966.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 8	+45° 53′	h m 5 9	− 8° 19′	h m 5 19	+28° 30′	h m 5 25	+74° 58′
	s	″	s	″	s	″	s	″
(Dec.30.4)	38.59 +.02	15.9 +1.5	18.32 +.01	42.8 −1.5	24.32 +.04	55.8 +0.5	11.93− .01	19.5 +2.9
Jan. 9.4	38.59 −.03	17.4 1.4	18.32 −.02	44.3 1.4	24.35 .00	56.4 0.5	11.86 .15	22.4 2.7
19.4	38.54 .08	18.7 1.2	18.28 .06	45.6 1.2	24.33 −.05	56.9 0.4	11.62 .31	25.1 2.5
29.4	38.42 .14	19.8 1.0	18.19 .10	46.7 1.0	24.26 .09	57.3 0.4	11.24 .45	27.4 2.2
Feb. 8.3	38.26 .18	20.7 0.8	18.08 .13	47.5 0.7	24.14 .13	57.6 0.3	10.72 .57	29.4 1.7
18.3	38.05 −.22	21.4 +0.5	17.93 −.16	48.1 −0.5	23.99 −.16	57.9 +0.2	10.10− .66	30.8 +1.2
28.3	37.82 .24	21.7 +0.2	17.76 .17	48.5 −0.2	23.82 .18	58.0 +0.1	9.39 .72	31.8 0.7
Mar. 10.2	37.57 .25	21.7 −0.1	17.58 .18	48.6 0.0	23.63 .19	58.1 0.0	8.65 .75	32.3 +0.2
20.2	37.32 .24	21.5 0.4	17.41 .17	48.4 +0.3	23.44 .18	58.0 −0.1	7.90 .74	32.2 −0.4
30.2	37.09 .22	20.9 0.7	17.24 .16	48.0 0.5	23.26 .17	57.8 0.2	7.18 .69	31.5 0.9
Apr. 9.2	36.89 −.19	20.1 −0.9	17.09 −.14	47.4 +0.8	23.09 −.15	57.5 −0.3	6.52− .61	30.4 −1.4
19.1	36.72 .14	19.1 1.1	16.97 .11	46.5 1.0	22.96 .11	57.1 0.4	5.95 .51	28.8 1.8
29.1	36.61 .09	18.0 1.2	16.88 .07	45.4 1.2	22.87 .07	56.7 0.4	5.50 .36	26.9 2.1
May 9.1	36.55 −.03	16.7 1.3	16.83 −.03	44.0 1.4	22.82 −.02	56.3 0.4	5.19 .24	24.6 2.3
19.1	36.55 +.03	15.4 1.3	16.82 +.01	42.5 1.6	22.82 +.02	55.9 0.4	5.02− .09	22.2 2.5
29.0	36.61 +.09	14.1 −1.3	16.86 +.06	40.7 +1.8	22.87 +.07	55.6 −0.3	5.01+ .08	19.7 −2.6
June 8.0	36.74 .15	12.9 1.2	16.94 .10	38.9 1.9	22.97 .12	55.3 0.2	5.15 .22	17.1 2.5
18.0	36.92 .21	11.8 1.0	17.06 .14	36.9 2.0	23.11 .17	55.1 −0.1	5.44 .37	14.6 2.4
27.9	37.16 .26	10.8 0.9	17.22 .18	34.9 2.0	23.30 .21	55.1 0.0	5.88 .50	12.2 2.3
July 7.9	37.44 .30	10.0 0.7	17.41 .21	32.9 2.0	23.53 .24	55.1 +0.1	6.45 .63	10.0 2.1
17.9	37.77 +.34	9.3 −0.5	17.63 +.23	30.9 +1.9	23.78 +.27	55.3 +0.2	7.14+ .74	8.0 −1.8
27.9	38.12 .37	8.9 0.3	17.88 .25	29.1 1.7	24.07 .30	55.5 0.3	7.93 .84	6.3 1.5
Aug. 6.8	38.51 .39	8.7 −0.1	18.14 .27	27.4 1.5	24.38 .32	55.8 0.3	8.81 .91	4.9 1.2
16.8	38.91 .41	8.6 +0.1	18.42 .28	26.0 1.3	24.70 .33	56.2 0.4	9.76 .97	3.9 0.8
26.8	39.32 .42	8.8 0.2	18.71 .29	24.8 1.0	25.03 .34	56.6 0.4	10.76 1.02	3.3 −0.4
Sept. 5.8	39.75 +.42	9.1 +0.4	19.00 +.29	24.0 +0.7	25.37 +.34	57.1 +0.4	11.79+1.04	3.1 0.0
15.7	40.17 .42	9.6 0.6	19.30 .29	23.5 +0.3	25.71 .34	57.5 0.4	12.84 1.05	3.2 +0.4
25.7	40.58 .41	10.3 0.7	19.58 .28	23.3 −0.1	26.05 .33	58.0 0.4	13.88 1.04	3.8 0.8
Oct. 5.7	40.99 .40	11.1 0.9	19.86 .27	23.6 0.4	26.38 .32	58.4 0.4	14.91 1.01	4.8 1.1
15.6	41.38 .38	12.1 1.0	20.13 .26	24.2 0.8	26.70 .31	58.8 0.4	15.90 .96	6.1 1.5
25.6	41.74 +.35	13.2 +1.2	20.39 +.24	25.1 −1.1	27.01 +.30	59.2 +0.4	16.84+ .90	7.8 +1.9
Nov. 4.6	42.09 .33	14.4 1.3	20.62 .22	26.4 1.3	27.29 .27	59.6 0.4	17.70 .81	9.9 2.2
14.6	42.40 .29	15.8 1.4	20.83 .19	27.8 1.5	27.56 .25	60.0 0.4	18.46 .71	12.2 2.5
24.5	42.67 .24	17.2 1.5	21.01 .16	29.4 1.6	27.79 .22	60.4 0.4	19.11 .58	14.9 2.7
Dec. 4.5	42.89 .19	18.8 1.5	21.16 .13	31.1 1.7	27.99 .18	60.8 0.5	19.63 .44	17.7 2.9
14.5	43.06 +.14	20.3 +1.6	21.27 +.09	32.8 −1.7	28.14 +.13	61.3 +0.5	20.00+ .29	20.6 +3.0
24.5	43.17 .08	21.9 1.5	21.34 +.05	34.5 1.6	28.25 .08	61.8 0.5	20.21+ .13	23.6 2.9
34.4	43.22 +.01	23.4 +1.4	21.37 .00	36.1 −1.5	28.32 +.03	62.3 +0.5	20.25− .04	26.5 +2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Orionis.		α Leporis.		ε Orionis.		α Columbæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 5 26	° ′ − 0 22	h m 5 27	° ′ −17 53	h m 5 30	° ′ − 1 16	h m 5 35	° ′ −34 7
	s	″	s	″	s	″	s	″
(Dec.30.4)	26.59 +.04	49.5 −1.2	55.89 +.02	64.6 −2.0	41.27 +.04	19.5 −1.3	43.09 .00	60.1 −2.7
Jan. 9.4	26.62 .00	50.7 1.1	55.90 −.02	66.6 1.9	41.30 .00	20.7 1.1	43.07 −.05	62.8 2.5
19.4	26.59 −.04	51.7 0.9	55.85 .06	68.4 1.7	41.28 −.04	21.8 0.9	43.00 .09	65.1 2.2
29.4	26.53 .08	52.5 0.7	55.77 .10	69.9 1.4	41.21 .08	22.7 0.8	42.88 .14	67.2 1.9
Feb. 8.3	26.42 .12	53.2 0.6	55.64 .14	71.1 1.1	41.11 .12	23.4 0.6	42.72 .18	68.8 1.4
18.3	26.29 −.15	53.7 −0.4	55.49 −.17	72.0 −0.7	40.98 −.14	23.9 −0.4	42.53 −.21	70.1 −1.0
28.3	26.13 .16	54.0 −0.2	55.32 .18	72.6 −0.4	40.82 .16	24.2 −0.2	42.31 .23	70.9 0.6
Mar. 10.3	25.96 .17	54.1 0.0	55.12 .19	72 8 0.0	40.65 .17	24.4 0.0	42.07 .24	71.2 −0.1
20.2	25.79 .17	54.1 +0.1	54.93 .19	72.7 +0.3	40.48 .17	24.3 +0.1	41.83 .24	71.1 +0.3
30.2	25.62 .16	53.8 0.3	54.74 .18	72.2 0.6	40.31 .16	24.1 0.3	41.60 .23	70.6 0.8
Apr. 9.2	25.47 −.14	53.4 +0.5	54.57 −.16	71.4 +0.9	40.16 −.14	23.7 +0.5	41.38 −.21	69.6 +1.2
19.1	25.35 .11	52.8 0.7	54.43 .13	70.3 1.2	40.03 .11	23.1 0.7	41.18 .18	68.2 1.6
29.1	25.25 .07	52.0 0.9	54.31 .09	69.0 1.5	39.93 .08	22.3 0.9	41.03 .14	66.4 1.9
May 9.1	25.20 −.04	51.1 1.0	54.24 .05	67.3 1.8	39.87 −.04	21.3 1.1	40.91 .10	64.3 2.2
19.1	25.18 .00	50.0 1.2	54.20 −.01	65.4 2.0	39.85 .00	20.2 1.2	40.83 −.05	61.9 2.5
29.0	25.21 +.05	48.7 +1.3	54.21 +.03	63.3 +2.2	39.88 +.04	18.9 +1.4	40.80 .00	59.2 +2.7
June 8.0	25.28 .09	47.4 1.4	54.26 .07	61.1 2.3	39.94 .08	17.4 1.5	40.82 +.04	56.4 2.9
18.0	25.39 .13	45.9 1.5	54.36 .11	58.7 2.4	40.05 .12	15.9 1.6	40.89 .09	53.4 3.0
28.0	25.54 .17	44.3 1.6	54.49 .15	56.3 2.4	40.19 .16	14.3 1.6	41.01 .14	50.4 3.0
July 7.9	25.72 .20	42.7 1.6	54.66 .19	53.9 2.3	40.37 .19	12 7 1.6	41.17 .18	47.4 2.9
17.9	25.94 +.23	41.1 +1.5	54 87 +.22	51.6 +2.2	40.58 +.22	11.1 +1.6	41.37 +.22	44.6 +2.7
27.9	26.18 .25	39.6 1.4	55.10 .24	49.4 2.0	40.82 .24	9.6 1.5	41.60 .25	41.9 2.5
Aug. 6.8	26.44 .27	38.2 1.3	55.35 .26	47.4 1.8	41.08 .26	8.2 1.3	41.86 .27	39.6 2.2
16.8	26.71 .28	37.0 1.1	55.63 .28	45.8 1.5	41.35 .28	6.9 1.1	42.14 .29	37.5 1.8
26.8	27.00 .29	36.0 0.9	55.91 .29	44.4 1.2	41.63 .29	5.9 0.9	42.45 .31	35.9 1.3
Sept. 5.8	27.29 +.29	35.2 +0.6	56.20 +.30	43.5 +0.7	41.92 +.29	5.1 +0.6	42.76 +.32	34.8 +0.8
15.7	27.58 .29	34.8 +0.3	56.50 .30	43.0 +0.3	42.21 .29	4.6 +0.3	43.09 .32	34.3 +0.3
25.7	27.87 .29	34.6 0.0	56.80 .29	42.9 −0.2	42.51 .29	4.5 0.0	43.41 .32	34.3 −0.3
Oct. 5.7	28.16 .28	34.7 −0.3	57.09 .28	43.3 0.6	42.79 .28	4.6 −0.3	43.73 .31	34.8 0.8
15.7	28.44 .27	35.1 0.5	57.37 .27	44.1 1.0	43.07 .27	5.1 0.6	44.04 .30	35.9 1.3
25.6	28.71 +.26	35.8 −0.8	57.64 +.26	45.4 −1.4	43.34 +.26	5.8 −0.8	44.33 +.28	37.5 −1.8
Nov. 4.6	28.96 .24	36.7 1.0	57.88 .24	47.0 1.7	43.59 .24	6.7 1.0	44.60 .25	39.6 2.2
14.6	29.18 .21	37.8 1.2	58.11 .21	48.8 2.0	43.82 .22	7.9 1.2	44.83 .22	42.0 2.5
24.5	29.38 .18	39.0 1.3	58.30 .18	50.9 2.2	44.03 .19	9.2 1.3	45.03 .18	44.7 2.8
Dec. 4.5	29.56 .15	40.4 1.3	58.46 .14	53.2 2.3	44.20 .16	10.6 1.4	45.19 .14	47.6 2.9
14.5	29.69 +.11	41.7 −1.3	58.58 +.10	55.4 −2.2	44.34 +.12	12.0 −1.4	45.31 +.09	50.5 −2.9
24.5	29.78 .07	43.0 1.2	58.66 +.05	57.6 2.1	44.44 .07	13.3 1.3	45.38 +.04	53.4 2.8
34.4	29.83 +.03	44.2 −1.1	58.69 .00	59.7 −1.9	44.49 +.03	14.6 −1.2	45.39 −.01	56.2 −2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis.		ν Orionis.		22 Camelop. (H.)		μ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 5 49	° ′ + 7 23	h m 6 1	° ′ +14 46	h m 6 6	° ′ +69 21	h m 6 16	° ′ +22 34
	s	″	s	″	s	″	s	″
(Dec.30.5)	16.54 +.07	11.2 −0.8	21.27 +.08	52.7 −0.4	51.55 +.14	29.1 +2.7	22.32 +.10	9.8 0.0
Jan. 9.5	16.59 +.02	10.4 0.7	21.33 +.04	52.4 0.3	51.64 +.02	31.8 2.6	22.40 .06	9.9 +0.1
19.4	16.59 −.02	9.8 0.6	21.35 −.01	52.1 0.2	51.60 −.12	34.4 2.5	22.44 +.01	10.0 0.2
29.4	16.54 .06	9.2 0.5	21.32 .05	51.9 0.2	51.44 .22	36.8 2.3	22.42 −.04	10.3 0.2
Feb. 8.4	16.46 .10	8.8 0.4	21.24 .09	51.8 −0.1	51.16 .32	39.0 2.0	22.35 .09	10.5 0.3
18.4	16.34 −.13	8.5 −0.3	21.12 −.13	51.7 0.0	50.78 −.41	40.8 +1.6	22.24 −.13	10.8 +0.3
28.3	16.19 .15	8.3 −0.1	20.98 .15	51.7 0.0	50.34 .46	42.2 1.1	22.10 .15	11.0 0.2
Mar. 10.3	16.02 .16	8.2 0.0	20.82 .17	51.8 +0.1	49.83 .52	43.1 0.7	21.93 .17	11.3 0.2
20.3	15.85 .17	8.2 +0.1	20.64 .17	51.8 0.1	49.30 .53	43.5 +0.2	21.75 .18	11.4 0.1
30.3	15.68 .16	8.4 0.2	20.47 .16	51.9 0.1	48.77 .52	43.4 −0.3	21.57 .18	11.6 +0.1
Apr. 9.2	15.53 −.14	8.6 +0.3	20.31 −.15	52.1 +0.1	48.26 −.48	42.8 −0.8	21.40 −.16	11.6 0.0
19.2	15.39 .12	9.0 0.4	20.17 .13	52.2 0.2	47.81 .42	41.8 1.2	21.25 .14	11.6 0.0
29.2	15.29 .09	9.4 0.5	20.06 .10	52.4 0.2	47.42 .34	40.4 1.6	21.13 .11	11.6 0.0
May 9.2	15.22 .05	10.0 0.6	19.98 .06	52.7 0.3	47.13 .24	38.6 1.9	21.04 .07	11.6 0.0
19.1	15.19 −.01	10.6 0.7	19.95 −.01	53.0 0.3	46.94 .14	36.5 2.1	20.99 −.02	11.5 0.0
29.1	15.20 +.03	11.4 +0.8	19.95 +.03	53.4 +0.4	46.85 −.03	34.3 −2.3	20.99 +.02	11.5 0.0
June 8.1	15.26 .07	12.3 0.9	20.00 .07	53.8 0.5	46.87 +.08	32.0 2.4	21.03 .06	11.5 0.0
18.0	15.36 .11	13.3 1.0	20.10 .11	54.4 0.5	47.01 .19	29.6 2.4	21.11 .10	11.5 +0.1
28.0	15.50 .15	14.4 1.1	20.23 .15	55.0 0.6	47.26 .30	27.2 2.3	21.24 .14	11.6 0.1
July 8.0	15.67 .19	15.5 1.1	20.40 .18	55.6 0.6	47.61 .39	24.9 2.2	21.40 .18	11.7 0.1
18.0	15.87 +.22	16.6 +1.1	20.60 +.21	56.3 +0.7	48.05 +.46	22.8 −2.0	21.60 +.21	11.9 +0.2
27.9	16.10 .24	17.7 1.0	20.82 .24	56.9 0.6	48.57 .56	20.8 1.8	21.82 .24	12.1 0.2
Aug. 6.9	16.35 .26	18.7 0.9	21.08 .26	57.6 0.6	49.17 .63	19.1 1.6	22.08 .26	12.3 0.2
16.9	16.62 .27	19.6 0.8	21.35 .28	58.1 0.5	49.83 .66	17.7 1.3	22.36 .28	12.4 0.2
26.8	16.90 .28	20.4 0.7	21.63 .29	58.6 0.4	50.54 .73	16.6 1.0	22.65 .30	12.6 0.1
Sept. 5.8	17.19 +.29	21.0 +0.5	21.93 +.30	59.0 +0.3	51.29 +.76	15.7 −0.6	22.96 +.31	12.7 +0.1
15.8	17.49 .30	21.3 +0.3	22.24 .31	59.3 +0.2	52.07 .78	15.3 −0.3	23.27 .32	12.7 0.0
25.8	17.79 .30	21.5 0.0	22.55 .31	59.4 0.0	52.86 .79	15.2 +0.1	23.60 .33	12.6 −0.1
Oct. 5.7	18.09 .30	21.4 −0.2	22.86 .31	59.3 −0.1	53.65 .79	15.4 0.5	23.92 .33	12.5 0.1
15.7	18.38 .29	21.1 0.4	23.16 .30	59.1 0.3	54.44 .77	16.1 0.8	24.25 .32	12.4 0.2
25.7	18.67 +.28	20.6 −0.6	23.46 +.29	58.7 −0.4	55.20 +.74	17.1 +1.1	24.57 +.31	12.1 −0.3
Nov. 4.7	18.94 .26	19.9 0.7	23.75 .28	58.3 0.5	55.92 .70	18.4 1.5	24.88 .29	11.8 0.3
14.6	19.19 .24	19.1 0.8	24.02 .26	57.8 0.6	56.59 .63	20.1 1.8	25.18 .28	11.6 0.3
24.6	19.42 .21	18.2 0.9	24.27 .23	57.2 0.6	57.19 .55	22.0 2.1	25.45 .26	11.3 0.2
Dec. 4.6	19.62 .18	17.3 0.9	24.49 .20	56.6 0.6	57.70 .46	24.3 2.4	25.69 .23	11.1 0.2
14.5	19.78 +.14	16.3 −0.9	24.67 +.16	56.0 −0.5	58.11 +.35	26.8 +2.5	25.90 +.19	10.9 −0.1
24.5	19.90 .10	15.4 0.9	24.81 .12	55.5 0.5	58.41 .23	29.4 2.6	26.07 .14	10.8 0.0
34.5	19.98 +.05	14.6 −0.8	24.91 +.07	55.1 −0.4	58.58 +.11	32.1 +2.7	26.19 +.09	10.9 +0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argûs. (*Canopus.*)		γ Geminorum.		α Canis Majoris. (*Sirius.*)		ε Canis Majoris.	
	Right Ascension.	**Declination** *South.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*	**Right Ascension.**	**Declination** *South.*
	$6^{h}\ 21^{m}$	$-52^{\circ}\ 37'$	$6^{h}\ 31^{m}$	$+16^{\circ}\ 29'$	$6^{h}\ 40^{m}$	$-16^{\circ}\ 33'$	$6^{h}\ 54^{m}$	$-28^{\circ}\ 49'$
	s	″	s	″	s	″	s	″
(Dec.30.5)	33.81 .00	69.5 −3.4	25.23 +.11	32.0 −0.4	21.39 +.10	59.4 −2.3	21.32 +.09	24.0 −2.9
Jan. 9.5	33.79 −.05	72.9 3.2	25.32 .07	31.7 0.3	21.46 +.05	61.7 2.2	21.40 +.05	26.8 2.7
19.4	33.70 .12	76.0 3.0	25.37 +.02	31.4 0.2	21.48 .00	63.8 2.0	21.42 .00	29.5 2.5
29.4	33.54 .19	78.8 2.7	25.36 −.03	31.3 −0.1	21.46 −.05	65.7 1.7	21.39 −.06	31.9 2.3
Feb. 8.4	33.32 .24	81.3 2.2	25.31 .07	31.3 0.0	21.39 .09	67.3 1.5	21.30 .10	34.1 2.0
18.4	33.05 −.29	83.2 −1.7	25.21 −.11	31.3 +0.1	21.28 −.13	68.6 −1.2	21.18 −.14	35.9 −1.6
28.3	32.74 .33	84.8 1.2	25.08 .14	31.4 0.1	21.14 .16	69.6 0.9	21.02 .18	37.3 1.2
Mar. 10.3	32.40 .35	85.8 0.7	24.93 .16	31.6 0.1	20.97 .18	70.3 0.5	20.82 .20	38.3 0.8
20.3	32.04 .36	86.2 −0.2	24.76 .17	31.7 0.2	20.78 .19	70.6 −0.2	20.62 .22	38.9 −0.4
30.3	31.68 .35	86.2 +0.3	24.58 .17	31.9 0.2	20.59 .19	70.6 +0.1	20.40 .22	39.1 0.0
Apr. 9.2	31.33 −.34	85.6 +0.8	24.42 −.16	32.1 +0.2	20.40 −.18	70.4 +0.4	20.18 −.21	38.9 +0.4
19.2	31.01 .31	84.6 1.3	24.26 .14	32.2 0.2	20.23 .16	69.8 0.7	19.98 .19	38.3 0.8
29.2	30.71 .27	83.0 1.8	24.14 .11	32.4 0.2	20.08 .14	68.8 1.0	19.80 .17	37.3 1.2
May 9.2	30.46 .23	81.0 2.2	24.04 .07	32.6 0.2	19.96 .11	67.7 1.3	19.64 .14	36.0 1.5
19.1	30.25 .18	78.7 2.5	23.99 −.03	32.9 0.3	19.87 .07	66.2 1.5	19.52 .10	34.3 1.8
29.1	30.10 −.12	76.0 +2.8	23.97 .00	33.2 +0.3	19.82 −.03	64.6 +1.7	19.43 −.06	32.4 +2.1
June 8.1	30.00 −.06	73.0 3.1	23.99 +.04	33.5 0.3	19.81 +.01	62.7 1.9	19.39 −.02	30.1 2.3
18.0	29.97 .00	69.8 3.2	24.06 .08	33.8 0.4	19.84 .05	60.7 2.0	19.39 +.02	27.7 2.5
28.0	30.00 +.06	66.5 3.3	24.16 .12	34.2 0.4	19.91 .09	58.6 2.1	19.42 .06	25.1 2.6
July 8.0	30.09 .12	63.2 3.3	24.31 .16	34.7 0.4	20.01 .12	56.4 2.1	19.50 .10	22.5 2.6
18.0	30.23 +.17	59.9 +3.2	24.48 +.19	35.1 +0.4	20.15 +.15	54.3 +2.1	19.62 +.13	19.9 +2.6
27.9	30.44 .23	56.8 3.0	24.69 .22	35.5 0.4	20.32 .18	52.3 2.0	19.78 .17	17.3 2.5
Aug. 6.9	30.69 .27	53.9 2.7	24.92 .24	35.9 0.4	20.52 .21	50.4 1.8	19.96 .20	15.0 2.3
16.9	30.98 .33	51.4 2.3	25.18 .26	36.3 0.3	20.74 .23	48.7 1.5	20.18 .23	12.8 2.0
26.8	31.32 .35	49.2 1.8	25.45 .28	36.6 0.2	20.99 .25	47.3 1.2	20.43 .26	11.0 1.6
Sept. 5.8	31.69 +.38	47.6 +1.3	25.74 +.29	36.7 +0.1	21.26 +.27	46.3 +0.8	20.69 +.26	9.6 +1.2
15.8	32.08 .40	46.6 0.7	26.04 .30	36.8 0.0	21.54 .28	45.6 +0.4	20.98 .29	8.6 0.7
25.8	32.48 .41	46.2 +0.1	26.35 .31	36.6 −0.2	21.83 .29	45.4 0.0	21.28 .31	8.2 +0.2
Oct. 5.7	32.90 .41	46.4 −0.6	26.66 .32	36.4 0.3	22.12 .30	45.6 −0.5	21.60 .32	8.2 −0.3
15.7	33.30 .40	47.3 1.2	26.98 .32	36.0 0.4	22.42 .30	46.2 0.9	21.91 .32	8.8 0.8
25.7	33.70 +.38	48.8 −1.8	27.29 +.31	35.6 −0.5	22.72 +.29	47.3 −1.3	22.23 +.31	10.0 −1.3
Nov. 4.7	34.06 .35	50.9 2.3	27.60 .30	35.0 0.6	23.01 .28	48.8 1.7	22.54 .30	11.6 1.8
14.6	34.39 .31	53.4 2.8	27.69 .28	34.4 0.6	23.28 .26	50.0 2.0	22.83 .28	13.6 2.2
24.6	34.67 .26	56.4 3.1	28.16 .26	33.7 0.6	23.54 .24	52.7 2.2	23.10 .25	16.0 2.5
Dec. 4.6	34.90 .20	59.7 3.3	28.41 .23	33.1 0.6	23.76 .21	55.0 2.3	23.34 .22	18.7 2.8
14.5	35.06 +.13	63.1 −3.5	28.62 +.19	32.5 −0.5	23.96 +.17	57.4 −2.4	23.55 +.18	21.6 −2.9
24.5	35.16 +.06	66.6 3.5	28.80 .15	32.0 0.4	24.11 .13	59.8 2.4	23.71 .13	24.5 2.9
34.5	35.19 −.01	70.1 −3.4	28.93 +.10	31.6 −0.3	24.22 +.08	62.1 −2.3	23.82 +.08	27.4 −2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Canis Majoris.		δ Geminorum.		Piazzi vii. 67.		α^2 Geminorum. (*Castor.*)	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 3	° ′ −26 12	h m 7 13	° ′ +22 10	h m 7 19	° ′ +68 41	h m 7 27	° ′ +32 7
	s	″	s	″	s	″	s	″
(Dec. 30.5)	58.26 +.11	69.8 −2.8	37.13 +.16	58.3 −0.2	34.08 +.34	14.6 +2.4	39.14 +.19	38.4 +0.3
Jan. 9.5	58.35 .06	72.6 2.7	37.27 .11	58.2 0.0	34.36 .22	17.1 2.5	39.31 .14	38.9 0.5
19.5	58.38 +.01	75.2 2.5	37.36 .06	58.2 +0.1	34.52 +.09	19.7 2.6	39.43 .08	39.5 0.7
29.5	58.37 −.04	77.6 2.2	37.40 +.01	58.4 0.2	34.55 −.04	22.4 2.6	39.48 +.03	40.3 0.8
Feb. 8.4	58.30 .09	79.7 1.9	37.38 −.04	58.6 0.3	34.45 .16	24.9 2.4	39.48 −.03	41.1 0.9
18.4	58.19 −.13	81.4 −1.6	37.32 −.08	59.0 +0.4	34.24 −.27	27.2 +2.2	39.42 −.08	42.0 +0.9
28.4	58.04 .16	82.9 1.2	37.21 .12	59.4 0.4	33.92 .36	29.3 1.9	39.32 .12	42.8 0.8
Mar. 10.3	57.86 .19	83.9 0.8	37.08 .15	59.8 0.4	33.52 .43	31.0 1.5	39.17 .16	43.6 0.7
20.3	57.66 .20	84.6 0.5	36.91 .17	60.2 0.4	33.07 .48	32.3 1.0	39.00 .18	44.3 0.6
30.3	57.45 .21	84.8 −0.1	36.74 .17	60.6 0.3	32.57 .50	33.1 0.6	38.81 .19	44.9 0.5
Apr. 9.3	57.25 −.20	84.7 +0.3	36.57 −.17	60.8 +0.3	32.07 −.49	33.4 +0.1	38.62 −.19	45.3 +0.3
19.2	57.05 .19	84.2 0.7	36.40 .15	61.1 0.2	31.58 .47	33.3 −0.4	38.44 .17	45.5 +0.1
29.2	56.87 .17	83.3 1.1	36.26 .13	61.2 0.1	31.12 .42	32.6 0.9	38.28 .15	45.5 0.0
May 9.2	56.72 .14	82.1 1.4	36.14 .10	61.4 +0.1	30.74 .35	31.5 1.3	38.14 .12	45.4 −0.2
19.1	56.60 .10	80.5 1.7	36.05 .07	61.4 0.0	30.42 .27	30.0 1.6	38.03 .08	45.2 0.3
29.1	56.51 −.06	78.7 +2.0	36.00 −.03	61.4 0.0	30.19 −.19	28.2 −1.9	37.96 −.04	44.8 −0.4
June 8.1	56.46 −.02	76.6 2.2	35.99 +.01	61.4 0.0	30.05 −.09	26.2 2.2	37.94 .00	44.4 0.5
18.1	56.46 +.02	74.3 2.4	36.02 .05	61.4 0.0	30.01 +.01	23.9 2.4	37.95 +.04	43.8 0.6
28.0	56.49 .05	71.9 2.5	36.09 .09	61.4 0.0	30.07 .11	21.4 2.5	38.01 .08	43.2 0.6
July 8.0	56.56 .09	69.4 2.5	36.20 .12	61.4 0.0	30.23 .21	18.9 2.5	38.11 .12	42.6 0.7
18.0	56.67 +.13	66.9 +2.5	36.34 +.16	61.3 −0.1	30.48 +.30	16.4 −2.5	38.25 +.16	41.9 −0.7
28.0	56.82 .16	64.4 2.4	36.51 .19	61.2 0.1	30.83 .39	13.9 2.4	38.43 .19	41.2 0.7
Aug. 6.9	57.00 .19	62.2 2.2	36.72 .22	61.1 0.1	31.26 .47	11.5 2.3	38.64 .22	40.4 0.7
16.9	57.20 .22	60.1 1.9	36.95 .24	61.0 0.2	31.77 .54	9.3 2.1	38.87 .25	39.7 0.8
26.9	57.44 .25	58.3 1.6	37.20 .26	60.7 0.2	32.34 .60	7.2 1.9	39.14 .28	38.9 0.8
Sept. 5.9	57.70 +.27	57.0 +1.2	37.48 +.28	60.4 −0.3	32.98 +.66	5.4 −1.7	39.43 +.30	38.2 −0.8
15.8	57.98 .29	56.0 0.7	37.77 .30	60.1 0.4	33.66 .71	3.9 1.4	39.74 .32	37.4 0.8
25.8	58.27 .30	55.5 +0.2	38.08 .31	59.6 0.5	34.39 .74	2.7 1.1	40.07 .34	36.6 0.8
Oct. 5.8	58.58 .31	55.6 −0.3	38.40 .32	59.1 0.6	35.15 .77	1.8 0.7	40.41 .35	35.8 0.8
15.7	58.89 .31	56.1 0.8	38.73 .33	58.4 0.6	35.92 .78	1.2 −0.3	40.77 .36	35.1 0.7
25.7	59.21 +.31	57.2 −1.3	39.07 +.33	57.8 −0.7	36.71 +.78	1.1 0.0	41.14 +.37	34.4 −0.7
Nov. 4.7	59.52 .30	58.7 1.8	39.40 .33	57.1 0.7	37.48 .76	1.3 +0.4	41.50 .36	33.8 0.6
14.7	59.81 .28	60.7 2.2	39.73 .32	56.4 0.7	38.23 .73	2.0 0.8	41.86 .35	33.2 0.5
24.6	60.09 .26	63.0 2.5	40.04 .30	55.7 0.6	38.94 .68	3.0 1.2	42.21 .34	32.8 0.3
Dec. 4.6	60.34 .23	65.6 2.7	40.33 .27	55.1 0.5	39.58 .61	4.5 1.6	42.54 .31	32.6 −0.1
14.6	60.55 +.19	68.4 −2.8	40.59 +.24	54.6 −0.4	40.16 +.52	6.3 +2.0	42.83 +.28	32.6 0.0
24.6	60.72 .15	71.2 2.8	40.81 .20	54.3 0.3	40.63 .42	8.5 2.3	43.09 .23	32.7 +0.2
34.5	60.84 +.10	74.0 −2.7	40.99 +.15	54.1 −0.1	40.99 +.30	10.8 +2.5	43.29 +.17	33.1 +0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Minoris. (*Procyon.*)		β Geminorum. (*Pollux.*)		φ Geminorum.		3 Ursæ Majoris (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 33	° ′ + 5 30	h m 7 38	° ′ +28 17	h m 7 46	° ′ +27 2	h m 8 1	° ′ +68 47
	s	″	s	″	s	″	s	″
(Dec 30.5)	36.13 +.16	17.2 −1.3	39.11 +.20	20.9 +0.1	49.92 +.20	51.5 0.0	59.64 +.44	36.0 +2.2
Jan. 9.5	36.27 .12	15.9 1.1	39.28 .15	21.1 0.3	50.10 .16	51.6 +0.2	60.03 .33	38.3 2.4
19.5	36.37 .07	14.8 1.0	39.40 .09	21.4 0.4	50.23 .10	51.9 0.3	60.30 .20	40.8 2.6
29.5	36.42 +.02	14.0 0.8	39.47 +.04	21.9 0.5	50.30 +.04	52.3 0.5	60.44 +.07	43.5 2.6
Feb. 8.4	36.41 −.03	13.2 0.6	39.48 −.02	22.5 0.6	50.32 −.01	52.9 0.6	60.45 −.05	46.1 2.6
18.4	36.36 −.07	12.7 −0.4	39.43 −.07	23.2 +0.7	50.29 −.06	53.5 +0.7	60.34 −.17	48.7 +2.5
28.4	36.27 .11	12.4 0.3	39.34 .11	24.0 0.7	50.20 .10	54.2 0.7	60.11 .28	51.1 2.2
Mar 10.3	36.15 .13	12.2 −0.1	39.21 .14	24.7 0.7	50.08 .14	54.9 0.7	59.78 .36	53.2 1.9
20.3	36.00 .15	12.1 0.0	39.05 .17	25.3 0.6	49.93 .16	55.5 0.6	59.38 .43	54.9 1.5
30.3	35.84 .16	12.2 +0.1	38.87 .18	25.9 0.5	49.76 .17	56.1 0.5	58.92 .47	56.2 1.0
Apr. 9.3	35.68 −.16	12.4 +0.2	38.69 −.18	26.3 +0.4	49.59 −.17	56.6 +0.4	58.43 −.49	57.0 +0.6
19.2	35.52 .15	12.7 0.3	38.52 .17	26.6 0.2	49.41 .16	56.9 0.3	57.94 .48	57.4 +0.1
29.2	35.38 .13	13.1 0.4	38.36 .15	26.8 +0.1	49.25 .15	57.2 0.2	57.47 .45	57.3 −0.4
May 9.2	35.25 .11	13.6 0.5	38.22 .12	26.8 0.0	49.12 .12	57.3 +0.1	57.03 .41	56.6 0.9
19.2	35.16 .08	14.2 0.6	38.11 .09	26.8 −0.1	49.01 .09	57.3 0.0	56.65 .35	55.6 1.3
29.1	35.10 −.05	14.8 +0.7	38.04 −.05	26.6 −0.2	48.93 −.06	57.2 −0.1	56.34 −.27	54.1 −1.6
June 8.1	35.07 −.01	15.6 0.8	38.00 −.01	26.3 0.3	48.89 −.02	57.0 0.2	56.11 .18	52.2 1.9
18.1	35.07 +.02	16.4 0.8	38.01 +.03	26.0 0.4	48.89 +.02	56.7 0.3	55.97 −.09	50.1 2.2
28.0	35.11 .06	17.2 0.8	38.05 .07	25.6 0.4	48.93 .06	56.4 0.4	55.93 .00	47.7 2.4
July 8.0	35.19 .09	18.0 0.8	38.14 .10	25.1 0.5	49.01 .09	56.0 0.4	55.98 +.10	45.2 2.6
18.0	35.29 +.12	18.8 +0.8	38.26 +.14	24.6 −0.5	49.12 +.13	55.5 −0.5	56.13 +.19	42.6 −2.7
28.0	35.43 .15	19.6 0.7	38.42 .17	24.1 0.6	49.27 .16	55.0 0.5	56.36 .28	39.9 2.7
Aug. 6.9	35.60 .18	20.3 0.6	38.61 .20	23.5 0.6	49.45 .19	54.5 0.6	56.69 .37	37.2 2.6
16.9	35.79 .20	20.9 0.5	38.83 .23	22.9 0.6	49.66 .22	53.9 0.6	57.10 .45	34.6 2.5
26.9	36.00 .23	21.3 0.3	39.07 .26	22.2 0.7	49.90 .25	53.2 0.7	57.59 .52	32.2 2.4
Sept. 5.9	36.24 +.25	21.6 +0.1	39.34 +.28	21.5 −0.7	50.16 +.27	52.5 −0.7	58.14 +.59	29.8 −2.2
15.8	36.50 .27	21.6 −0.1	39.63 .30	20.8 0.8	50.44 .29	51.8 0.8	58.76 .65	27.7 2.0
25.8	36.78 .28	21.4 0.3	39.94 .32	20.0 0.8	50.75 .31	50.9 0.8	59.43 .69	25.9 1.7
Oct. 5.8	37.06 .29	20.9 0.6	40.27 .34	19.2 0.8	51.07 .33	50.1 0.9	60.15 .73	24.4 1.4
15.7	37.37 .30	20.2 0.8	40.62 .35	18.4 0.8	51.41 .34	49.2 0.9	60.91 .76	23.2 1.0
25.7	37.68 +.31	19.2 −1.0	40.97 +.35	17.5 −0.8	51.76 +.35	48.3 −0.9	61.69 +.78	22.3 −0.6
Nov. 4.7	37.99 .31	18.1 1.2	41.32 .35	16.7 0.8	52.11 .35	47.4 0.9	62.47 .78	21.9 −0.2
14.7	38.29 .30	16.8 1.4	41.67 .34	16.0 0.7	52.46 .34	46.6 0.8	63.26 .77	21.9 +0.2
24.6	38.59 .29	15.4 1.5	42.01 .33	15.4 0.6	52.80 .33	45.8 0.7	64.01 .73	22.4 0.7
Dec. 4.6	38.87 .27	13.9 1.5	42.34 .31	14.9 0.4	53.13 .31	45.2 0.5	64.72 .68	23.3 1.1
14.6	39.12 +.24	12.4 −1.5	42.63 +.27	14.6 −0.2	53.43 +.28	44.8 −0.3	65.38 +.61	24.6 +1.5
24.6	39.34 .20	11.0 1.4	42.88 .23	14.5 0.0	53.69 .24	44.5 −0.1	65.94 .52	26.4 1.9
34.5	39.52 +.15	9.6 −1.3	43.10 +.19	14.5 +0.1	53.91 +.19	44.5 +0.1	66.41 +.41	28.5 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	15 Argûs (ρ)		η Cancri.		ε Hydræ.		ι Ursæ Majoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$8^{h}\ 2^{m}$	$-23^\circ\ 59'$	$8^{h}\ 26^{m}$	$+20^\circ\ 48'$	$8^{h}\ 40^{m}$	$+\ 6^\circ\ 48'$	$8^{h}\ 51^{m}$	$+48^\circ\ 27'$
	s	″	s	″	s	″	s	″
(Dec.30.6)	54.65 +.17	18.5 −2.8	24.58 +.23	40.4 −0.5	60.41 +.23	69.1 −1.5	45.08 +.34	65.3 +0.8
Jan. 9.5	54.81 .13	21.3 2.7	24.80 .19	39.9 0.4	60.62 .18	67.7 1.3	45.39 .28	66.3 1.1
19.5	54.91 .08	24.0 2.6	24.96 .14	39.6 −0.2	60.79 .14	66.5 1.1	45.64 .21	67.5 1.4
29.5	54.96 +.02	26.6 2.4	25.07 .08	39.6 0.0	60.90 .09	65.5 0.9	45.82 .14	69.0 1.6
Feb. 8.5	54.95 −.03	28.9 2.2	25.13 +.03	39.7 +0.2	60.96 +.04	64.8 0.6	45.92 +.07	70.8 1.7
18.4	54.90 −.07	31.0 −1.9	25.14 −.02	40.0 +0.4	60.98 −.01	64.2 −0.4	45.96 .00	72.6 +1.8
28.4	54.80 .11	32.7 1.6	25.09 .06	40.4 0.5	60.94 .05	63.9 0.2	45.92 −.07	74.4 1.8
Mar. 10.4	54.67 .15	34.1 1.2	25.00 .10	41.0 0.5	60.87 .09	63.7 −0.1	45.82 .13	76.2 1.7
20.4	54.51 .17	35.1 0.8	24.89 .13	41.5 0.6	60.77 .12	63.7 +0.1	45.66 .17	77 9 1.6
30.3	54.33 .18	35.8 0.5	24.74 .15	42.1 0.6	60.64 .14	63.9 0.2	45.47 .20	79.4 1.3
Apr. 9.3	54.14 −.19	36.1 −0.1	24.59 −.16	42.6 +0.5	60.50 −.15	64.1 +0.3	45.25 −.22	80.6 +1.0
19.3	53.95 .18	36.1 +0.2	24.43 .15	43.2 0.5	60.35 .15	64.5 0.4	45.02 .23	81.5 0.7
29.3	53.77 .17	35.7 0.6	24.28 .14	43.6 0.4	60.20 .14	64.9 0 5	44.78 .23	82.0 +0.4
May 9.2	53.61 .16	34.9 0.9	24.14 .13	43.9 0.3	60.07 .12	65.4 0.5	44.56 .21	82.2 0.0
19.2	53.47 .13	33.8 1.2	24.02 .11	44.2 0.2	59.95 .10	65.9 0.6	44.36 .19	82.1 −0.3
29.2	53.35 −.10	32.5 +1.5	23.93 −.08	44.4 +0.1	59.86 −.08	66.5 +0.6	44.19 −.15	81.7 −0.6
June 8.1	53.27 .07	30.9 1.8	23.86 .05	44.6 0.0	59.79 .05	67.1 0.6	44.06 .11	80.9 0.9
18.1	53.22 −.03	29.0 2.0	23.83 −.01	44.6 0.0	59.75 −.02	67.8 0.6	43.97 .07	79.8 1.2
28.1	53.20 .00	27.0 2.1	23.84 +.02	44.6 −0.1	59.74 .00	68.4 0.6	43.92 −.03	78.5 1.4
July 8.1	53.22 +.04	24.8 2.2	23.87 .05	44.5 0.1	59.76 +.03	69.0 0.6	43.92 +.02	77.0 1.6
18.0	53.27 +.07	22.6 +2.2	23.94 +.08	44.4 −0.2	59.80 +.06	69.6 +0.6	43.96 +.07	75.3 −1.8
28.0	53.36 .10	20.3 2.2	24.04 .11	44.1 0.3	59.88 .09	70.2 0.5	44.05 .11	73.4 1.9
Aug. 7.0	53.48 .14	18.2 2.1	24.17 .14	43.8 0.4	59.98 .12	70.6 0.4	44.18 .15	71.4 2.0
17.0	53.63 .17	16.2 1.9	24.34 .17	43.3 0.5	60.12 .15	71.0 0.3	44.36 .20	69.4 2.1
26.9	53.82 .20	14.4 1.6	24.52 .20	42.8 0.6	60.28 .17	71.1 +0.1	44.58 .24	67.3 2.1
Sept. 5.9	54.03 +.23	13.0 +1.3	24.74 +.23	42.1 −0.7	60.46 +.20	71.1 −0.1	44.84 +.28	65.2 −2.1
15.9	54.27 .25	11.9 0.9	24.98 .25	41.4 0.8	60.68 .23	70.9 0.3	45.14 .32	63.1 2.0
25.8	54.54 .27	11.2 +0.4	25.25 .28	40.4 0.9	60.92 .25	70.5 0.5	45.48 .35	61.1 1.9
Oct. 5.8	54.82 .29	11.0 0.0	25.54 .30	39.4 1.0	61.18 .27	69.8 0.8	45.85 .39	59.2 1.8
15.8	55.13 .31	11.3 −0.5	25.85 .32	38.3 1.1	61.47 .29	68.9 1.0	46.25 .42	57.4 1.7
25.8	55.44 +.32	12.1 −1.0	26.18 +.33	37.1 −1.2	61.77 +.31	67.8 −1.2	46.68 +.44	55.8 −1.5
Nov. 4.7	55.76 .32	13.4 1.5	26.52 .34	35.9 1.3	62.08 .32	66.4 1.4	47.13 .45	54.4 1.2
14.7	56.08 .31	15.1 1.9	26.86 .34	34.6 1.3	62.41 .32	64.9 1.6	47.60 .46	53.3 0.9
24.7	56.40 .30	17.2 2.3	27.20 .33	33.4 1.2	62.73 .32	63.3 1.6	48.06 .46	52.5 0.6
Dec. 4.7	56.69 .28	19.7 2.5	27.53 .32	32.2 1.1	63.05 .31	61.6 1.7	48.52 .44	52.1 −0.3
14.6	56.95 +.26	22.3 −2.7	27.85 +.30	31.2 −0.9	63.35 +.29	60.0 −1.6	48.95 +.41	52.0 +0.1
24.6	57.18 .21	25.1 2.8	28.13 .27	30.4 0.7	63.62 .26	58.4 1.5	49.35 .37	52.3 0.5
34.6	57.37 +.16	28.0 −2.8	28.37 +.22	29.7 −0.5	63.86 +.22	56.9 −1.4	49.70 +.32	53.0 +0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Ursæ Majoris.		κ Cancri.		ι Argûs.		1 Draconis (H.)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 9 0	° ′ +67 34	h m 9 1	° ′ +11 6	h m 9 14	° ′ −58 48	h m 9 21	° ′ +81 48
	s	″	s	″	s	″	s	″
(Dec.30.6)	49.28 +.54	29.9 +1.5	50.74 +.25	26.0 −1.3	11.50 +.31	46.9 −3.5	35.82+1.38	19.2 +1.9
Jan. 9.6	49.78 .45	31.6 1.9	50.97 .21	24.8 1.1	11.78 .24	50.5 3.6	37.10 1.15	21.3 2.3
19.6	50.18 .34	33.8 2.3	51.16 .16	23.8 0.9	11.97 .15	54.2 3.7	38.12 .88	23.8 2.7
29.5	50.46 .22	36.2 2.5	51.30 .11	23.0 0.6	12.09 +.07	58.0 3.7	38.86 .59	26.6 2.9
Feb. 8.5	50.62 +.10	38.8 2.6	51.39 .06	22.5 0.4	12.12 −.01	61.7 3.6	39.30+ .28	29.6 3.0
18 5	50.66 −.02	41.4 +2.6	51.42 +.01	22.2 −0.2	12.07 −.08	65.3 −3.5	39.42− .03	32.7 +3.0
28.4	50.58 .13	44.0 2.5	51.41 −.03	22.0 0.0	11.94 .15	68.6 3.2	39.23 .33	35.7 2.9
Mar. 10.4	50.39 .23	46.5 2.3	51.36 .07	22.1 +0.1	11.75 .22	71.7 2.9	38.75 .61	38.6 2.7
20.4	50.11 .32	48.8 2.1	51.27 .10	22.3 0.2	11.49 .27	74.4 2.5	38.02 .84	41.2 2.4
30.4	49.76 .38	50.7 1.7	51.15 .12	22.6 0.3	11.20 .31	76.7 2.0	37.06 1.04	43.4 2.0
Apr. 9.3	49.35 −.42	52.2 +1.3	51.02 −.14	23.0 +0.4	10.86 −.34	78.5 −1.6	35.94−1.18	45.2 +1.5
19.3	48.91 .44	53.2 0.8	50.88 .14	23.4 0.5	10.51 .36	79.9 1.1	34.70 1.27	46.4 1.0
29.3	48.46 .44	53.8 +0.3	50.74 .14	23.9 0.5	10.14 .37	80.8 0.6	33.40 1.31	47.2 +0.4
May 9.3	48.02 .42	53.9 −0.2	50.61 .13	24.4 0.5	9.77 .36	81.1 −0.1	32.08 1.30	47.3 −0.2
19.2	47.61 .39	53.4 0.6	50.49 .11	24.9 0.5	9.41 .35	80.9 +0.4	30.81 1.23	46.8 0.7
29.2	47.25 −.34	52.6 −1.1	50.39 −.09	25.4 +0.5	9.07 −.33	80.2 +0.9	29.62−1.13	45.8 −1.2
June 8.2	46.94 .27	51.3 1.5	50.31 .06	25.9 0.5	8.76 .30	79.0 1.4	28.55 .99	44.4 1.7
18.1	46.70 .20	49.6 1.[illegible]	50.26 .04	26.4 0.4	8.48 .26	77.4 1.8	27.64 .81	42.4 2.1
28.1	46.53 .12	47.5 2.2	50.23 −.01	26.8 0.4	8.24 .21	75.4 2.2	26.92 .62	40.0 2.5
July 8.1	46.45 −.04	45.2 2.4	50.23 +.02	27.2 0.3	8.05 .16	73.0 2.5	26.40 .41	37.3 2.8
18.1	46.44 +.04	42.6 −2.6	50.26 +.04	27.5 +0.3	7.91 −.11	70.3 +2.8	26.10− .19	34.3 −3.1
28.0	46.52 .12	39.9 2.8	50.32 .07	27.7 0.2	7.83 −.05	67.4 3.0	26.02+ .04	31.1 3.3
Aug. 7.0	46.69 .20	37.0 2.9	50.41 .10	27.9 +0.1	7.81 +.02	64.3 3.0	26.17 .26	27.8 3.4
17.0	46.93 .28	34.1 2.9	50.53 .13	27.9 0.0	7.86 .08	61.3 3.0	26.55 .49	24.4 3.4
27.0	47.25 .36	31.2 2.9	50.67 .16	27.8 −0.2	7.98 .15	58.4 2.9	27.15 .71	21.0 3.3
Sept. 5.9	47.65 +.43	28.4 −2.8	50.85 +.19	27.5 −0.4	8.16 +.22	55.6 +2.6	27.97+ .92	17.7 −3.2
15.9	48.12 .50	25.6 2.6	51.05 .21	27.0 0.6	8.41 .28	53.2 2.2	28.99 1.12	14.5 3.1
25.9	48.65 .56	23.1 2.4	51.28 .24	26.3 0.8	8.72 .34	51.1 1.8	30.20 1.30	11.5 2.8
Oct. 5.8	49.25 .62	20.8 2.2	51.53 .26	25.4 1.0	9.10 .39	49.6 1.3	31.59 1.46	8.8 2.5
15.8	49.90 .67	18.7 1.9	51.81 .29	24.3 1.2	9.52 .44	48.6 +0.7	33.13 1.60	6.5 2.2
25.8	50.59 +.71	17.0 −1.5	52.11 +.31	23.1 −1.4	9.97 +.47	48.2 0.0	34.80+1.71	4.5 −1.7
Nov. 4.8	51.31 .73	15.6 1.1	52.43 .32	21.6 1.5	10.46 .49	48.4 −0.6	36.56 1.79	3.0 1.2
14.7	52.06 .75	14.7 0.7	52.76 .33	20.1 1.6	10.96 .50	49.3 1.2	38.38 1.83	2.0 0.7
24.7	52.81 .74	14.2 −0.2	53.09 .33	18.4 1.6	11.45 .48	50.9 1.8	40.21 1.82	1.6 −0.2
Dec. 4.7	53.54 .72	14.3 +0.3	53.42 .32	16.8 1.6	11.92 .46	53.0 2.4	42.02 1.77	1.7 +0.4
14.7	54.23 +.68	14.8 +0.8	53.74 +.30	15.2 −1.5	12.36 +.41	55.7 −2.9	43.75+1.66	2.4 +0.9
24.6	54.87 .60	15.9 1.2	54.03 .28	13.7 1.4	12.75 .35	58.8 3.3	45.34 1.50	3.6 1.5
34.6	55.43 +.52	17.3 +1.7	54.29 +.24	12.4 −1.2	13.08 +.29	62.2 −3.6	46.76+1.30	5.4 +2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON

Mean Solar Date.	α Hydræ.		δ Ursæ Majoris.		θ Ursæ Majoris.		ε Leonis.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 9 22	° ′ − 8 11	h m 9 24	° ′ +70 18	h m 9 25	° ′ +52 10	h m 9 39	° ′ +24 16
	s	″	s	″	s	″	s	″
(Dec.30.6)	13.94 +.25	4.4 −2.3	51.70 +.65	24.7 +1.4	34.30 +.39	19.7 +0.6	39.85 +.30	32.1 −0.8
Jan. 9.6	14.18 .21	6.6 2.1	52.30 .55	26.4 1.9	34.67 .34	20.6 1.0	40.13 .26	31.4 0.5
19.6	14.37 .17	8.7 2.0	52.80 .43	28.4 2.2	34.98 .27	21.8 1.4	40.37 .21	31.0 −0.2
29.5	14.51 .12	10.6 1.9	53.17 .30	30.8 2.5	35.22 .20	23.3 1.7	40.56 .16	30.9 0.0
Feb. 8.5	14.61 .07	12.4 1.7	53.41 .17	33.4 2.7	35.38 .12	25.1 1.9	40.70 .11	31.0 +0.3
18.5	14.65 +.02	14.0 −1.4	53.51 +.03	36.2 +2.8	35.46 +.04	27.1 +2.1	40.78 +.05	31.5 +0.5
28.4	14.65 −.02	15.2 1.1	53.48 −.10	39.0 2.7	35.46 −.03	29.2 2.1	40.81 .00	32.1 0.7
Mar. 10.4	14.61 .06	16.3 0.9	53.31 .21	41.6 2.6	35.39 .10	31.3 2.0	40.79 −.04	32.9 0.8
20.4	14.53 .09	17.1 0.6	53.04 .32	44.1 2.3	35.26 .16	33.2 1.9	40.73 .06	33.8 0.9
30.4	14.42 .11	17.6 0.4	52.68 .40	46.3 2.0	35.08 .20	35.0 1.7	40.63 .11	34.7 0.9
Apr. 9.3	14.30 −.13	17.8 −0.1	52.25 −.45	48.0 +1.5	34.87 −.23	36.6 +1.4	40.51 −.13	35.6 +0.9
19.3	14.16 .14	17.9 +0.1	51.76 .49	49.4 1.1	34.63 .25	37.8 1.1	40.38 .14	36.4 0.8
29.3	14.02 .14	17.7 0.3	51.25 .51	50.2 0.6	34.38 .25	38.7 0.7	40.23 .14	37.2 0.7
May 9.3	13.88 .13	17.3 0.5	50.74 .50	50.6 +0.1	34.13 .24	39.2 +0.3	40.09 .14	37.9 0.6
19.2	13.76 .12	16.8 0.6	50.25 .47	50.4 −0.4	33.89 .22	39.3 −0.1	39.96 .13	38.4 0.4
29.2	13.64 −.10	16.0 +0.8	49.80 −.42	49.7 −0.9	33.68 −.20	39.1 −0.5	39.84 −.11	38.8 +0.3
June 8.2	13.55 .08	15.1 1.0	49.41 .36	48.5 1.4	33.50 .16	38.4 0.9	39.74 .09	39.0 +0.1
18.1	13.48 .06	14.1 1.1	49.08 .29	47.0 1.8	33.36 .12	37.4 1.2	39.66 .06	39.0 0.0
28.1	13.43 .04	13.0 1.1	48.82 .21	45.0 2.2	33.26 .06	36.1 1.5	39.60 .04	39.0 −0.2
July 8.1	13.40 −.01	11.8 1.2	48.65 .13	42.6 2.5	33.20 −.03	34.5 1.7	39.58 −.01	38.7 0.3
18.1	13.41 +.01	10.6 +1.2	48.57 −.03	40.0 −2.7	33.19 +.01	32.7 −1.9	39.58 +.01	38.3 −0.5
28.0	13.43 .04	9.4 1.2	48.58 +.06	37.2 2.9	33.23 .06	30.6 2.1	39.60 .04	37.8 0.6
Aug. 7.0	13.49 .07	8.2 1.1	48.68 .15	34.2 3.0	33.31 .11	28.4 2.3	39.66 .07	37.0 0.8
17.0	13.57 .10	7.1 1.0	48.87 .24	31.2 3.1	33.44 .15	26.0 2.4	39.75 .10	36.2 0.9
27.0	13.69 .13	6.2 0.8	49.16 .33	28.1 3.1	33.62 .20	23.6 2.5	39.87 .13	35.2 1.1
Sept. 5.9	13.83 +.16	5.4 +0.6	49.53 +.41	25.0 −3.0	33.84 +.25	21.1 −2.5	40.01 +.16	34.0 −1.2
15.9	14.00 .19	5.0 +0.3	49.98 .50	22.0 2.9	34.11 .29	18.6 2.5	40.19 .19	32.7 1.4
25.9	14.20 .22	4.8 0.0	50.52 .58	19.1 2.7	34.43 .34	16.2 2.4	40.40 .23	31.3 1.5
Oct. 5.8	14.44 .25	5.0 −0.3	51.13 .65	16.4 2.5	34.79 .38	13.8 2.3	40.65 .26	29.7 1.6
15.8	14.70 .27	5.5 0.7	51.82 .71	14.1 2.2	35.18 .42	11.6 2.1	40.92 .29	28.0 1.7
25.8	14.98 +.29	6.4 −1.0	52.56 +.76	12.0 −1.9	35.62 +.45	9.6 −1.9	41.23 +.31	26.3 −1.8
Nov. 4.8	15.29 .31	7.6 1.4	53.34 .80	10.4 1.4	36.08 .47	7.8 1.6	41.56 .33	24.5 1.8
14.7	15.61 .32	9.1 1.7	54.16 .83	9.1 1.0	36.56 .49	6.3 1.3	41.90 .35	22.8 1.7
24.7	15.93 .32	11.0 1.9	54.99 .83	8.4 −0.5	37.06 .50	5.1 1.0	42.26 .36	21.1 1.6
Dec. 4.7	16.26 .31	13.0 2.1	55.82 .81	8.1 0.0	37.55 .49	4.4 0.6	42.62 .36	19.5 1.5
14.7	16.57 +.30	15.2 −2.2	56.61 +.77	8.4 +0.5	38.03 +.46	4.0 −0.1	42.98 +.35	18.1 −1.3
24.6	16.86 .27	17.5 2.3	57.36 .70	9.2 1.1	38.48 .43	4.1 +0.3	43.32 .32	16.9 1.0
34.6	17.12 +.23	19.8 −2.2	58.02 +.62	10.6 +1.6	38.89 +.38	4.6 +0.7	43.62 +.29	16.0 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Leonis.		α Leonis. (*Regulus.*)		32 Ursæ Majoris.		γ¹ Leonis.	
	Right Ascension.	**Declination *North*.**	**Right Ascension.**	**Declination *North*.**	**Right Ascension.**	**Declination *North*.**	**Right Ascension.**	**Declination *North*.**
	9h 46m	+26° 30′	10h 2m	+12° 29′	10h 10m	+65° 38′	10h 13m	+20° 23′
	s	″	s	″	s	″	s	″
(Dec.30.6)	33.85 +.31	70.7 −0.8	33.89 +.29	60.7 −1.5	7.70 +.60	57.0 +0.7	57.62 +.32	33.3 −1.3
Jan. 9.6	34.14 .27	70.1 0.5	34.17 .26	59.3 1.3	8.27 .54	58.0 1.2	57.92 .28	32.2 1.0
19.6	34.39 .22	69.8 −0.1	34.42 .22	58.2 1.0	8.78 .45	59.4 1.7	58.19 .24	31.4 0.6
29.6	34.59 .17	69.8 +0.2	34.61 .17	57.3 0.8	9.18 .35	61.3 2.1	58.40 .19	30.9 −0.3
Feb. 8.5	34.74 .12	70.1 0.4	34.76 .12	56.6 0.5	9.49 .25	63.6 2.4	58.57 .14	30.7 0.0
18.5	34.83 +.06	70.6 +0.6	34.86 +.07	56.3 −0.2	9.69 +.14	66.1 +2.6	58.69 +.09	30.8 +0.2
28.5	34.87 +.01	71.3 0.8	34.91 +.03	56.2 0.0	9.77 +.03	68.7 2.7	58.75 +.04	31.2 0.4
Mar. 10.5	34.85 −.04	72.2 0.9	34.91 −.02	56.3 +0.2	9.75 −.07	71.4 2.6	58.77 .00	31.7 0.6
20.4	34.80 .08	73.2 1.0	34.88 .06	56.6 0.4	9.63 .16	74.0 2.5	58.75 −.04	32.4 0.8
30.4	34.70 .11	74.3 1.0	34.80 .08	57.0 0.5	9.42 .24	76.4 2.3	58.68 .07	33.2 0.8
Apr. 9.4	34.59 −.13	75.3 +1.0	34.71 −.10	57.5 +0.6	9.14 −.30	78.6 +2.0	58.59 −.10	34.1 +0.9
19.3	34.45 .14	76.2 0.9	34.60 .12	58.1 0.6	8.80 .35	80.4 1.6	58.48 .12	35.0 0.9
29.3	34.30 .15	77.1 0.8	34.47 .12	58.7 0.6	8.43 .38	81.8 1.1	58.36 .13	35.8 0.8
May 9.3	34.16 .14	77.8 0.6	34.35 .12	59.4 0.6	8.04 .39	82.7 0.6	58.23 .13	36.6 0.7
19.3	34.02 .13	78.3 0.4	34.23 .12	60.0 0.6	7.65 .38	83.1 +0.2	58.11 .12	37.3 0.6
29.2	33.90 −.11	78.7 +0.3	34.12 −.11	60.5 +0.5	7.28 −.36	83.0 −0.3	57.99 −.11	37.8 +0.5
June 8.2	33.79 .09	78.9 +0.1	34.02 .09	61.0 0.5	6.93 .33	82.5 0.8	57.88 .10	38.2 0.3
18.2	33 70 .07	78.9 −0.1	33.94 .07	61.5 0.4	6.61 .29	81.4 1.2	57.79 .08	38.5 +0.2
28.2	33.64 .05	78.8 0.2	33.87 .05	61.8 0.3	6.35 .24	80.0 1.6	57.72 .06	38.6 0.0
July 8.1	33.61 −.02	78.4 0.4	33.83 .03	62.1 0.2	6.14 .16	78.2 2.0	57.67 .04	38.6 −0 1
18.1	33.60 +.01	77.9 −0.6	33.81 −.01	62.3 +0.1	5.99 −.11	75.9 −2.4	57.64 −.01	38.4 −0.2
28.1	33.62 .04	77.2 0.7	33.82 +.02	62.4 0.0	5.91 −.05	73.4 2.6	57.64 +.01	38.1 0.4
Aug. 7.0	33.67 .07	76.4 0.9	33.85 .04	62.3 −0.1	5.90 +.02	70.7 2.8	57.66 .04	37.6 0.6
17.0	33.75 .10	75.4 1.1	33.90 .07	62.1 0.3	5.95 .09	67.7 3.0	57.71 .06	36.9 0.8
27.0	33.86 .13	74.2 1.2	33.99 .10	61.8 0.5	6.08 .16	64.6 3.1	57.79 .09	36.0 0.9
Sept. 6.0	34.01 +.16	72.9 −1.4	34.10 +.13	61.2 −0.7	6.28 +.24	61.4 −3.2	57.90 +.12	35.0 −1.1
15.9	34.18 .19	71.5 1.5	34.25 .16	60.5 0.8	6.56 .31	58.2 3.2	58.04 .16	33.8 1.3
25.9	34.39 .22	69.9 1.6	34.42 .19	59.5 1.0	6.90 .38	55.1 3.1	58.21 .19	32.4 1.5
Oct. 5.9	34.63 .26	68.2 1.7	34.63 .22	58.4 1.2	7.32 .45	52.0 3.0	58.42 .22	30.8 1.6
15.9	34.91 .29	66.4 1.8	34.88 .25	57.0 1.4	7.80 .51	49.1 2.7	58.66 .26	29.1 1.8
25.8	35.21 +.32	64.6 −1.8	35.15 +.28	55.5 −1.6	8.35 +.57	46.5 −2.5	58.94 +.29	27.3 −1.9
Nov. 4.8	35.54 .34	62.7 1.8	35.45 .31	53.8 1.7	8.95 .62	44.2 2.1	59.24 .32	25.4 2.0
14.8	35.89 .35	60.9 1.8	35.77 .33	52.0 1.8	9.60 .66	42.2 1.7	59.57 .34	23.4 2.0
24.7	36.25 .36	59.2 1.7	36.10 .34	50.1 1.9	10.27 .68	40.7 1.3	59.91 .35	21.4 1.9
Dec. 4.7	36.62 .36	57.6 1.5	36.44 .34	48.2 1.9	10.96 .69	39.7 0.8	60.27 .36	19.6 1.8
14.7	36.98 +.35	56.2 −1.3	36.78 +.33	46.4 −1.8	11.65 +.67	39.2 −0.2	60.62 +.35	17.8 −1.6
24.7	37.32 .33	55.1 1.0	37.11 .31	44.6 1.6	12.31 .64	39.2 +0.3	60.97 .33	16.3 1.4
34.6	37.64 +.30	54.2 −0.7	37.41 +.28	43.1 −1.4	12.93 +.58	39.8 +0.9	61.29 +.31	15.0 −1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Draconis (H.)		ρ Leonis.		η Argûs.		ι Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 25	° ′ +76 15	h m 10 27	° ′ + 9 51	h m 10 40	° ′ −59 6	h m 10 43	° ′ +11 7
	s	″	s	″	s	″	s	″
(Dec.30.6)	51.48+1.00	76.4 +0.9	4.10 +.31	64.5 −1.7	50.21 +.44	20.2 −2.9	31.38 +.32	20.4 −1.8
Jan. 9.6	52.44 .90	77.6 1.4	4.39 .27	62.9 1.5	50.63 .39	23.2 3.2	31.68 .29	18.8 1.5
19.6	53.28 .77	79.2 1.9	4.65 .23	61.5 1.3	50.98 .32	26.6 3.5	31.95 .25	17.4 1.2
29.6	53.98 .61	81.4 2.3	4.86 .19	60.4 1.0	51.27 .25	30.1 3.7	32.18 .21	16.2 1.0
Feb. 8.5	54.51 .44	83.9 2.6	5.04 .15	59.5 0.7	51.48 .17	33.8 3.7	32.37 .16	15.4 0.7
18.5	54.86+ .26	86.6 +2.9	5.16 +.10	59.0 −0.4	51.61 +.09	37.6 −3.7	32.51 +.11	14.9 −0.4
28.5	55.03+ .08	89.6 3.0	5.23 .05	58.6 −0.2	51.66 +.02	41.3 3.6	32.60 .07	14.6 −0.1
Mar. 10.5	55.01− .10	92.6 2.9	5.26 +.01	58.6 0.0	51.64 −.05	44.8 3.4	32.64 +.03	14.6 +0.1
20.4	54.81 .27	95.5 2.8	5.24 −.03	58.7 +0.2	51.53 .11	48.1 3.2	32.65 −.01	14.8 0.3
30.4	54.46 .42	98.2 2.5	5.20 .06	59.0 0.4	51.40 .17	51.2 2.9	32.61 .05	15.2 0.4
Apr. 9.4	53.98− .54	100.5 +2.2	5.12 −.08	59.4 +0.5	51.20 −.22	53.9 −2.5	32.55 −.07	15.7 +0.5
19.4	53.38 .63	102.6 1.8	5.03 .10	60.0 0.6	50.96 .26	56.2 2.1	32.47 .09	16.3 0.6
29.3	52.71 .70	104.1 1.3	4.92 .11	60.6 0.6	50.69 .29	58.1 1.6	32.37 .10	16.9 0.7
May 9.3	51.99 .73	105.1 0.7	4.80 .11	61.2 0.6	50.38 .31	59.5 1.2	32.26 .11	17.6 0.7
19.3	51.24 .74	105.5 +0.2	4.69 .11	61.8 0.6	50.07 .32	60.4 0.7	32.15 .11	18.3 0.6
29.3	50.51− .72	105.5 −0.4	4.58 −.10	62.4 +0.6	49.74 −.32	60.9 −0.2	32.04 −.11	18.9 +0.6
June 8.2	49.81 .67	104.8 0.9	4.48 .09	63.0 0.5	49.42 .32	60.8 +0.3	31.93 .10	19.5 0.5
18.2	49.16 .61	103.7 1.4	4.39 .08	63.5 0.5	49.10 .31	60.3 0.8	31.84 .09	20.0 0.5
28.2	48.59 .53	102.0 1.8	4.31 .07	64.0 0.4	48.80 .29	59.2 1.3	31.76 .07	20.5 0.4
July 8.1	48.10 .43	100.0 2.3	4.26 .05	64.4 0.3	48.53 .26	57.8 1.7	31.69 .06	20.8 0.3
18.1	47.72− .32	97.5 −2.6	4.22 −.03	64.7 +0.2	48.29 −.22	55.9 +2.1	31.65 −.04	21.1 +0.2
28.1	47.46 .21	94.7 2.9	4.20 .00	64.8 +0.1	48.09 .18	53.6 2.4	31.62 −.02	21.2 +0.1
Aug. 7.1	47.31− .09	91.6 3.2	4.21 +.02	64.9 0.0	47.93 .12	51.1 2.6	31.61 .00	21.2 −0.1
17.0	47.28+ .04	88.3 3.4	4.24 .05	64.8 −0.1	47.84 −.06	48.4 2.8	31.63 +.03	21.0 0.2
27.0	47.39 .17	84.9 3.5	4.30 .07	64.6 0.3	47.80 .00	45.6 2.8	31.67 .06	20.6 0.4
Sept. 6.0	47.62+ .30	81.4 −3.5	4.39 +.10	64.2 −0.5	47.84 +.07	42.8 +2.7	31.74 +.09	20.1 −0.6
16.0	47.99 .43	77.8 3.5	4.51 .13	63.5 0.7	47.94 .14	40.0 2.6	31.85 .12	19.4 0.8
25.9	48.48 .56	74.4 3.4	4.66 .17	62.6 1.0	48.12 .22	37.5 2.4	31.98 .15	18.4 1.1
Oct. 5.9	49.10 .68	71.0 3.2	4.85 .20	61.6 1.2	48.38 .29	35.4 2.0	32.16 .19	17.2 1.3
15.9	49.84 .79	67.9 3.0	5.07 .24	60.3 1.4	48.70 .36	33.6 1.5	32.36 .22	15.8 1.5
25.8	50.69+ .89	65.1 −2.7	5.32 +.27	58.7 −1.6	49.09 +.42	32.4 +1.0	32.60 +.26	14.2 −1.7
Nov. 4.8	51.63 .98	62.6 2.2	5.61 .29	57.0 1.8	49.54 .46	31.7 +0.4	32.88 .29	12.4 1.9
14.8	52.66 1.05	60.6 1.8	5.92 .32	55.2 1.9	50.02 .50	31.6 −0.2	33.18 .31	10.5 2.0
24.7	53.74 1.10	59.0 1.3	6.25 .33	53.2 2.0	50.53 .52	32.1 0.9	33.51 .33	8.4 2.0
Dec. 4.7	54.85 1.11	58.0 0.7	6.58 .34	51.2 2.0	51.06 .52	33.3 1.5	33.85 .34	6.4 2.0
14.7	55.96+1.10	57.5 −0.1	6.93 +.34	49.2 −1.9	51.58 +.50	35.1 −2.1	34.19 +.34	4.4 −2.0
24.7	57.04 1.05	57.7 +0.5	7.26 .32	47.3 1.8	52.07 .47	37.4 2.6	34.53 .33	2.4 1.9
34.6	58.06+ .98	58.5 +1.1	7.57 +.30	45.6 −1.6	52.52 +.43	40.2 −3.0	34.85 +.31	0.6 −1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		δ Leonis.		δ Crateris.		τ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 10 56	° ′ +62 19	h m 11 8	° ′ +21 6	h m 11 13	° ′ −14 11	h m 11 22	° ′ + 3 27
	s	″	s	″	s	″	s	″
(Dec.30.7)	60.18 +.59	71.3 0.0	18.28 +.34	73.3 −1.5	52.99 +.32	10.0 −2.4	19.35 +.33	27.3 −2.0
Jan. 9.7	60.75 .54	71.6 +0.5	18.61 .32	71.9 1.2	53.30 .30	12.4 2.4	19.67 .30	25.3 1.9
19.6	61.26 .48	72.4 1.1	18.91 .28	70.8 0.9	53.58 .26	14.8 2.4	19.96 .27	23.4 1.7
29.6	61.71 .40	73.7 1.6	19.18 .24	70.2 0.5	53.82 .22	17.2 2.3	20.21 .23	21.8 1.5
Feb. 8.6	62.07 .32	75.5 2.0	19.40 .19	69.8 −0.2	54.03 .18	19.4 2.1	20.43 .19	20.5 1.2
18.5	62.34 +.22	77.6 +2.3	19.57 +.15	69.8 +0.1	54.19 +.13	21.4 −1.9	20.60 +.15	19.4 −0.9
28.5	62.52 .13	80.1 2.5	19.69 .10	70.1 0.4	54.30 .09	23.2 1.7	20.73 .10	18.6 0.7
Mar. 10.5	62.60 +.03	82.7 2.6	19.76 .05	70.6 0.7	54.37 .05	24.8 1.4	20.81 .06	18.1 0.4
20.5	62.58 −.05	85.4 2.6	19.79 +.01	71.4 0.9	54.39 +.01	26.2 1.2	20.85 +.02	17.8 −0.2
30.4	62.49 .13	87.9 2.5	19.78 −.03	72.4 1.0	54.38 −.02	27.3 1.0	20.85 −.01	17.7 0.0
Apr. 9.4	62.32 −.20	90.4 +2.3	19.74 −.06	73.4 +1.1	54.34 −.05	28.1 −0.7	20.83 −.04	17.9 +0.2
19.4	62.09 .25	92.6 2.0	19.66 .08	74.5 1.1	54.28 .07	28.7 0.5	20.78 .06	18.2 0.4
29.3	61.81 .29	94.4 1.6	19.57 .10	75.5 1.0	54.20 .09	29.0 −0.2	20.70 .08	18.6 0.5
May 9.3	61.50 .32	95.8 1.2	19.47 .11	76.5 0.9	54.10 .10	29.2 0.0	20.62 .09	19.1 0.5
19.3	61.18 .33	96.8 0.8	19.35 .11	77.4 0.8	54.00 .11	29.1 +0.2	20.52 .10	19.6 0.6
29.3	60.85 −.33	97.4 +0.3	19.24 −.11	78.2 +0.7	53.89 −.11	28.8 +0.4	20.42 −.10	20.3 +0.6
June 8.2	60.52 .31	97.4 −0.2	19.13 .10	78.8 0.5	53.78 .11	28.3 0.6	20.32 .10	20.9 0.6
18.2	60.22 .29	97.0 0.7	19.02 .10	79.3 0.3	53.67 .10	27.7 0.7	20.23 .09	21.5 0.6
28.2	59.94 .26	96.1 1.1	18.92 .09	79.6 +0.2	53.58 .09	26.9 0.9	20.14 .08	22.1 0.6
July 8.2	59.70 .22	94.7 1.5	18.84 .07	79.6 0.0	53.49 .08	26.0 1.0	20.06 .07	22.6 0.5
18.1	59.50 −.18	92.9 −1.9	18.78 −.06	79.5 −0.2	53.41 −.07	24.9 +1.1	19.99 −.06	23.1 +0.5
28.1	59.35 .13	90.8 2.3	18.73 .04	79.2 0.4	53.34 .06	23.8 1.1	19.93 .05	23.6 0.4
Aug. 7.1	59.25 .07	88.3 2.6	18.70 −.02	78.7 0.6	53.30 .04	22.7 1.1	19.89 .03	23.9 0.3
17.0	59.20 −.02	85.6 2.9	18.69 +.01	77.9 0.8	53.27 −.01	21.6 1.1	19.87 −.01	24.1 +0.1
27.0	59.21 +.04	82.6 3.1	18.71 .03	77.0 1.0	53.27 +.02	20.6 1.0	19.87 +.01	24.2 0.0
Sept. 6.0	59.29 +.11	79.4 −3.2	18.76 +.07	75.8 −1.3	53.30 +.05	19.7 +0.8	19.90 +.04	24.1 −0.2
16.0	59.43 .18	76.1 3.3	18.84 .10	74.4 1.5	53.37 .08	19.0 0.6	19.96 .08	23.7 0.4
25.9	59.64 .24	72.8 3.3	18.96 .13	72.9 1.7	53.47 .12	18.5 0.4	20.06 .11	23.2 0.7
Oct. 5.9	59.92 .31	69.5 3.3	19.11 .17	71.1 1.9	53.61 .16	18.2 +0.1	20.19 .15	22.3 0.9
15.9	60.26 .38	66.2 3.2	19.30 .21	69.2 2.0	53.79 .20	18.4 −0.3	20.36 .19	21.3 1.2
25.9	60.68 +.44	63.1 −3.0	19.54 +.25	67.0 −2.1	54.01 +.24	18.8 −0.6	20.57 +.23	20.0 −1.4
Nov. 4.8	61.15 .50	60.2 2.7	19.80 .28	64.8 2.2	54.27 .27	19.6 1.0	20.82 .26	18.4 1.7
14.8	61.68 .55	57.7 2.4	20.10 .31	62.6 2.3	54.56 .30	20.8 1.3	21.10 .29	16.6 1.9
24.8	62.25 .59	55.5 2.0	20.43 .34	60.3 2.2	54.87 .32	22.3 1.7	21.40 .32	14.6 2.0
Dec. 4.7	62.85 .61	53.7 1.5	20.78 .35	58.2 2.1	55.21 .34	24.2 2.0	21.73 .33	12.5 2.1
14.7	63.47 +.61	52.5 −1.0	21.14 +.36	56.1 −1.9	55.55 +.34	26.2 −2.2	22.07 +.34	10.4 −2.2
24.7	64.08 .60	51.8 −0.4	21.50 .35	54.2 1.7	55.89 .33	28.5 2.3	22.41 .33	8.2 2.1
34.7	64.68 +.57	51.7 +0.1	21.84 +.33	52.6 −1.4	56.22 +.31	30.9 −2.4	22.74 +.32	6.1 −2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Draconis.		ν Leonis.		β Leonis.		γ Ursæ Majoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 11 24	° ′ +69 55	h m 11 31	° ′ − 0 13	h m 11 43	° ′ +15 10	h m 11 48	° ′ +54 17
	s	″	s	″	s	″	s	″
(Dec. 30.7)	56.07 +.77	45.2 −0.1	21.47 +.33	14.2 −2.2	29.37 +.34	52.7 −1.9	5.52 +.50	51.9 −0.9
Jan. 9.7	56.82 .73	45.4 +0.4	21.79 .30	16.3 2.0	29.70 .32	51.0 1.6	6.02 .48	51.2 −0.4
19.6	57.52 .66	46.1 1.0	22.08 .27	18.2 1.9	30.01 .29	49.5 1.3	6.48 .44	51.2 +0.2
29.6	58.14 .57	47.4 1.5	22.34 .24	20.0 1.7	30.29 .26	48.3 1.0	6.90 .39	51.7 0.7
Feb. 8.6	58.66 .47	49.2 2.0	22.56 .20	21.6 1.4	30.53 .22	47.5 0.6	7.27 .33	52.7 1.2
18.5	59.08 +.35	51.5 +2.4	22.74 +.16	22.9 −1.2	30.72 +.17	47.0 −0.3	7.57 +.27	54.2 +1.7
28.5	59.37 .23	54.1 2.7	22.87 .11	23.9 0.9	30.88 .13	46.9 0.0	7.80 .20	56.1 2.0
Mar. 10.5	59.53 +.10	56.9 2.8	22.96 .07	24.7 0.6	30.98 .08	47.0 +0.3	7.96 .12	58.3 2.3
20.5	59.57 −.02	59.8 2.9	23.01 +.03	25.2 0.4	31.05 +.04	47.4 0.5	8.04 +.05	60.7 2.4
30.4	59.49 .13	62.7 2.8	23.03 .00	25.5 −0.2	31.07 .00	48.1 0.7	8.06 −.02	63.2 2.5
Apr. 9.4	59.30 −.23	65.4 +2.6	23.01 −.03	25.6 0.0	31.06 −.03	48.9 +0.8	8.00 −.08	65.7 +2.4
19.4	59.02 .32	67.8 2.3	22.96 .05	25.4 +0.2	31.02 .05	49.8 0.9	7.90 .13	68.1 2.3
29.4	58.66 .38	70.0 1.9	22.90 .07	25.2 0.3	30.96 .07	50.7 1.0	7.75 .17	70.2 2.0
May 9.3	58.25 .43	71.7 1.5	22.82 .08	24.8 0.4	30.88 .09	51.7 0.9	7.56 .20	72.2 1.7
19.3	57.80 .46	73.0 1.0	22.73 .09	24.4 0.5	30.79 .10	52.6 0.9	7.35 .22	73.7 1.3
29.3	57.32 −.48	73.8 +0.5	22.63 −.10	23.8 +0.6	30.69 −.10	53.4 +0.8	7.12 −.23	74.8 +0.9
June 8.3	56.84 .47	74.0 0.0	22.53 .10	23.2 0.6	30.58 .10	54.2 0.7	6.88 .24	75.6 +0.5
18.2	56.37 .46	73.7 −0.5	22.44 .09	22.6 0.6	30.48 .10	54.8 0.6	6.65 .23	75.9 0.0
28.2	55.93 .43	72.9 1.0	22.35 .09	22.0 0.6	30.38 .10	55.3 0.4	6.42 .22	75.7 −0.4
July 8.2	55.52 .38	71.6 1.5	22.26 .08	21.4 0.6	30.29 .09	55.6 0.2	6.20 .21	75.1 0.8
18.1	55.16 −.33	69.8 −2.0	22.19 −.07	20.8 +0.6	30.21 −.08	55.8 +0.1	6.01 −.19	74.0 −1.2
28.1	54.85 .27	67.6 2.4	22.12 .06	20.2 0.5	30.13 .07	55.8 −0.1	5.83 .16	72.5 1.6
Aug. 7.1	54.61 .20	65.0 2.7	22.07 .04	19.7 0.4	30.08 .06	55.6 0.3	5.69 .12	70.7 2.0
17.1	54.45 .13	62.1 3.0	22.04 −.02	19.3 0.3	30.04 −.03	55.2 0.5	5.59 .09	68.4 2.4
27.0	54.36 −.05	58.9 3.3	22.04 +.01	19.1 +0.2	30.02 .00	54.5 0.7	5.52 −.04	65.9 2.7
Sept. 6.0	54.35 +.04	55.5 −3.5	22.06 +.04	19.0 0.0	30.03 +.03	53.7 −0.9	5.50 .00	63.1 −2.9
16.0	54.43 .13	52.0 3.6	22.11 .07	19.1 −0.2	30.07 .06	52.7 1.1	5.53 +.05	60.1 3.1
26.0	54.61 .22	48.4 3.6	22.20 .10	19.4 0.5	30.14 .09	51.4 1.4	5.61 .11	56.9 3.3
Oct. 5.9	54.88 .31	44.7 3.6	22.32 .14	20.0 0.7	30.26 .13	49.9 1.6	5.75 .17	53.6 3.3
15.9	55.24 .40	41.2 3.5	22.48 .18	20.9 1.0	30.41 .17	48.2 1.8	5.95 .23	50.2 3.4
25.9	55.69 +.50	37.8 −3.3	22.68 +.22	22.1 −1.3	30.60 +.21	46.2 −2.0	6.22 +.29	46.8 −3.3
Nov. 4.8	56.24 .59	34.6 3.0	22.92 .26	23.5 1.5	30.84 .25	44.2 2.2	6.54 .35	43.6 3.1
14.8	56.87 66	31.8 2.7	23.19 .29	25.2 1.8	31.11 .29	41.9 2.3	6.91 .40	40.5 2.9
24.8	57.56 .72	29.3 2.2	23.50 .31	27.0 2.0	31.41 .32	39.6 2.3	7.34 .44	37.7 2.6
Dec. 4.8	58.31 .76	27.3 1.7	23.82 .33	29.1 2.1	31.74 .34	37.3 2.3	7.80 .47	35.2 2.2
14.7	59.09 +.79	25.8 −1.2	24.16 +.34	31.2 −2.2	32.08 +.35	35.1 −2.2	8.30 +.50	33.2 −1.8
24.7	59.88 .78	25.0 −0.6	24.50 .33	33.4 2.2	32.43 .34	33.0 2.0	8.80 .51	31.6 1.3
34.7	60.66 +.76	24.7 0.0	24.83 +.32	35.6 −2.1	32.77 +.33	31.0 −1.8	9.31 +.50	30.6 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		4 Draconis (H.)		γ Corvi.		*β* Chamæleontis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 11 59	° ′ + 9 19	h m 12 7	° ′ +78 12	h m 12 10	° ′ −16 56	h m 12 11	° ′ −78 41
	s	″	s	″	s	″	s	″
(Dec.30.7)	38.66 +.34	79.9 −2.1	6.30+1.23	65.2 −0.5	11.18 +.34	1.4 −2.2	56.58+1.20	58.5 −1.4
Jan. 9.7	38.99 .32	77.9 1.8	7.52 1.20	65.0 +0.1	11.51 .32	3.7 2.3	57.76 1.13	60.3 2.0
19.7	39.30 .30	76.2 1.6	8.69 1.12	65.4 0.7	11.83 .30	6.0 2.3	58.85 1.03	62.6 2.5
29.6	39.58 .27	74.7 1.3	9.77 1.02	66.5 1.3	12.12 .27	8.4 2.2	59.83 .91	65.3 3.0
Feb. 8.6	39.83 .23	73.6 1.0	10.72 .88	68.1 1.9	12.37 .23	10.6 2.1	60.67 .77	68.5 3.3
18.6	40.04 +.18	72.7 −0.7	11.52+ .71	70.3 +2.3	12.58 +.19	12.8 −2.0	61.36+ .60	72.0 −3.6
28.6	40.20 .14	72.2 0.4	12.14 .52	72.8 2.7	12.75 .15	14.8 1.8	61.88 .44	75.7 3.8
Mar. 10.5	40.32 .10	72.0 −0.1	12.56 .32	75.7 2.9	12.88 .11	16.5 1.6	62.23 .27	79.5 3.9
20.5	40.40 .06	72.1 +0.2	12.77+ .11	78.7 3.0	12.97 .07	18.0 1.4	62.42+ .10	83.4 3.8
30.5	40.45 +.02	72.4 0.4	12.78− .08	81.7 3.0	13.02 +.03	19.3 1.1	62.43− .07	87.2 3.7
Apr. 9.5	40.45 −.01	72.8 +0.6	12.60− .27	84.7 +2.9	13.04 .00	20.4 −0.9	62.28− .22	90.9 −3.6
19.4	40.43 .03	73.5 0.7	12.24 .44	87 5 2.6	13.03 −.03	21.2 0.6	61.98 .37	94.4 3.4
29.4	40.39 .05	74.2 0.8	11.72 .58	90.0 2.3	12.99 .05	21.8 0.4	61.54 .51	97.6 3.1
May 9.4	40.32 .07	75.0 0.8	11.08 .70	92.1 1.9	12.93 .07	22.2 −0.2	60.96 .63	100.5 2.7
19.3	40.24 .08	75.8 0.8	10.32 .78	93.8 1.4	12.86 .08	22.4 0.0	60.27 .74	103.0 2.3
29.3	40.16 −.09	76.5 +0.7	9.50− .85	94.9 +0.9	12.77 −.09	22.4 +0.2	59.48− .83	105.1 −1.8
June 8.3	40.06 .09	77.3 0.7	8.63 .88	95.5 +0.3	12.68 .10	22.2 0.4	58.61 .90	106.7 1.3
18.3	39.96 .10	78.0 0.6	7.74 .88	95.6 −0.2	12.58 .10	21.8 0.5	57.69 .94	107.7 0.8
28.2	39.87 .10	78.5 0.5	6.86 .87	95.1 0.7	12.47 .11	21.2 0.7	56.72 .97	108.2 −0.2
July 8.2	39.77 .09	79.0 0.4	6.01 .82	94.1 1.3	12.36 .10	20.5 0.8	55.75 .96	108.2 +0.3
18.2	39.68 −.08	79.4 +0.3	5.21− .76	92.5 −1.8	12.26 −.10	19.7 +0.9	54.79− .93	107.6 +0.8
28.1	39.60 .07	79.6 +0.2	4.48 .68	90.5 2.2	12.16 .09	18.8 1.0	53.88 .87	106.5 1.3
Aug. 7.1	39.54 .06	79.6 0.0	3.85 .58	88.0 2.6	12.08 .08	17.8 1.1	53.05 .78	104.8 1.8
17.1	39.49 .04	79.5 −0.2	3.32 .47	85.2 3.0	12.00 .06	16.8 1.1	52.32 .66	102.8 2.2
27.1	39.46 −.02	79.3 0.4	2.91 .34	82.0 3.3	11.95 .04	15.8 1.0	51.73 .51	100.3 2.6
Sept. 6.0	39.45 +.01	78.8 −0.6	2.64− .20	78.5 −3.6	11.93 −.01	14.9 +0.9	51.30− .34	97.6 +2.8
16.0	39.47 .04	78.1 0.8	2.51− .06	74.9 3.7	11.94 +.02	14.1 0.8	51.05− .15	94.7 2.9
26.0	39.53 .07	77.1 1.0	2.53+ .10	71.1 3.8	11.98 .06	13.4 0.6	51.00+ .06	91.7 3.0
Oct. 6.0	39.63 .11	76.0 1.3	2.71 .24	67.2 3.8	12.07 .11	13.0 +0.3	51.16 .26	88.7 2.9
15.9	39.76 .15	74.6 1.5	3.05 .46	63.4 3.8	12.19 .15	12.9 0.0	51.53 .47	85.9 2.7
25.9	39.94 +.19	72.9 −1.7	3.56+ .59	59.6 −3.6	12.37 +.19	13.0 −0.3	52.11+ .67	83.4 +2.3
Nov. 4.9	40.15 .23	71.0 1.9	4.22 .74	56.1 3.4	12.58 .24	13.6 0.6	52.87 .85	81.3 1.9
14.8	40.41 .27	69.0 2.1	5.04 .89	52.9 3.1	12.84 .28	14.5 0.9	53.80 1.00	79.6 1.4
24.8	40.70 .30	66.8 2.2	6.00 1.01	50.0 2.6	13.14 .31	15.7 1.3	54.86 1.11	78.5 0.8
Dec. 4.8	41.02 .32	64.6 2.3	7.07 1.11	47.6 2.1	13.46 .33	17.3 1.6	56.03 1.19	78.0 +0.2
14.8	41.35 +.34	62.3 −2.2	8.22+1 18	45.8 −1.6	13.80 +.34	19.1 −1.9	57.25+1.23	78.1 −0.5
24.7	41.70 .34	60.1 2.1	9.44 1.22	44.5 0.9	14.14 .35	21.2 2.1	58.49 1.22	78.9 1.1
34.7	42.04 +.33	58.0 −2.0	10.66+1.22	43.8 −0.3	14.49 +.34	23.4 −2.2	59.71+1.19	80.3 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Virginis.		α¹ Crucis.		β Corvi.		κ Draconis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 14	° ′ − 0 3	h m 12 20	° ′ −62 29	h m 12 28	° ′ −22 47	h m 12 28	° ′ +70 22
	s	″	s	″	s	″	s	″
(Dec. 30.7)	18.92 +.33	35.1 −2.2	31.18 +.57	18.2 −1.7	38.67 +.36	25.6 −2.1	49.52 +.79	66.9 −1.0
Jan. 9.7	19.25 .32	37.2 2.1	31.75 .55	20.1 2.2	39.02 .34	27.8 2.3	50.31 .77	66.2 −0.4
19.7	19.56 .30	39.2 1.9	32.29 .51	22.5 2.6	39.35 .32	30.2 2.4	51.07 .74	66.1 +0.2
29.6	19.85 .27	41.1 1.7	32.78 .46	25.4 3.0	39.66 .29	32.6 2.4	51.79 .68	66.7 0.8
Feb. 8.6	20.10 .23	42.7 1.5	33.20 .39	28.5 3.2	39.93 .25	35.0 2.4	52.43 .60	67.9 1.4
18.6	20.32 +.19	44.0 −1.2	33.56 +.32	31.9 −3.4	40.17 +.21	37.3 −2.3	52.99 +.50	69.6 +2.0
28.6	20.49 .15	45.1 0.9	33.84 .25	35.4 3.5	40.36 .17	39.5 2.1	53.44 .39	71.8 2.4
Mar. 10.5	20.62 .11	45.9 0.6	34.06 .17	39.0 3.6	40.51 .13	41.6 1.9	53.78 .27	74.4 2.7
20.5	20.72 .07	46.4 0.4	34.19 .10	42.5 3.5	40.62 .09	43.4 1.7	53.99 .15	77.2 2.9
30.5	20.77 .04	46.7 −0.2	34.25 +.03	46.0 3.4	40.69 .05	45.1 1.5	54.08 +.03	80.1 2.9
Apr. 9.5	20.80 +.01	46.8 0.0	34.25 −.04	49.3 −3.2	40.73 +.02	46.5 −1.3	54.05 −.08	83.0 +2.9
19.4	20.79 −.02	46.6 +0.2	34.18 .10	52.4 2.9	40.74 −.01	47.7 1.1	53.91 .19	85.9 2.8
29.4	20.76 .04	46.4 0.3	34.05 .15	55.2 2.6	40.72 .03	48.7 0.8	53.67 .28	88.6 2.5
May 9.4	20.71 .06	46.0 0.4	33.87 .20	57.6 2.3	40.67 .05	49.4 0.6	53.35 .35	90.9 2.1
19.3	20.65 .07	45.5 0.5	33.64 .24	59.7 1.9	40.61 .07	49.9 0.4	52.96 .41	92.8 1.7
29.3	20.57 −.08	44.9 +0.6	33.38 −.28	61.4 −1.4	40.52 −.09	50.1 −0.1	52.52 −.46	94.4 +1.3
June 8.3	20.48 .09	44.3 0.6	33.08 .31	62.6 1.0	40.43 .10	50.2 +0.1	52.04 .48	95.4 0.7
18.3	20.39 .09	43.7 0.6	32.76 .33	63.3 −0.5	40.33 .11	50.0 0.3	51.55 .50	95.9 +0.2
28.2	20.29 .09	43.1 0.6	32.42 .34	63.6 0.0	40.21 .11	49.6 0.5	51.04 .50	95.8 −0.3
July 8.2	20.20 .09	42.5 0.6	32.07 .35	63.3 +0.5	40.10 .12	49.0 0.7	50.55 .49	95.2 0.8
18.2	20.11 −.09	42.0 +0.5	31.73 −.34	62.6 +1.0	39.98 −.12	48.2 +0.9	50.07 −.46	94.2 −1.3
28.2	20.02 .08	41.4 0.5	31.40 .32	61.4 1.4	39.87 .11	47.3 1.0	49.62 .42	92.6 1.8
Aug. 7.1	19.94 .07	41.0 0.4	31.09 .28	59.8 1.8	39.77 .10	46.2 1.1	49.23 .37	90.5 2.3
17.1	19.88 .05	40.7 0.3	30.82 .24	57.8 2.1	39.68 .08	45.1 1.2	48.88 .31	88.0 2.7
27.1	19.84 .03	40.5 +0.1	30.61 .19	55.5 2.4	39.60 .06	43.9 1.2	48.60 .25	85.2 3.0
Sept. 6.0	19.82 −.01	40.5 0.0	30.45 −.12	53.0 +2.6	39.56 −.03	42.7 +1.1	48.39 −.17	82.0 −3.3
16.0	19.83 +.02	40.6 −0.2	30.37 −.04	50.4 2.7	39.55 .00	41.6 1.0	48.26 −.08	78.6 3.5
26.0	19.87 .06	41.0 0.5	30.36 +.04	47.7 2.6	39.57 +.04	40.7 0.8	48.23 +.01	75.0 3.7
Oct. 6.0	19.95 .10	41.6 0.7	30.45 .13	45.1 2.5	39.64 .09	39.9 0.6	48.29 .11	71.2 3.8
15.9	20.07 .14	42.5 1.0	30.63 .22	42.7 2.2	39.75 .13	39.4 +0.3	48.45 .21	67.4 3.8
25.9	20.23 +.18	43.6 −1.3	30.90 +.31	40.6 +1.9	39.91 +.18	39.2 0.0	48.72 +.32	63.6 −3.7
Nov. 4.9	20.44 .22	45.0 1.5	31.26 .39	38.9 1.5	40.11 .23	39.4 −0.3	49.09 .42	59.9 3.6
14.9	20.68 .26	46.7 1.7	31.69 .47	37.7 1.0	40.37 .27	39.9 0.7	49.57 .52	56.4 3.3
24.8	20.96 .30	48.6 1.9	32.19 .52	37.0 +0.4	40.66 .31	40.8 1.1	50.14 .61	53.3 3.0
Dec. 4.8	21.27 .32	50.6 2.1	32.74 .57	36.9 −0.2	40.98 .33	42.1 1.4	50.79 .68	50.5 2.5
14.8	21.60 +.33	52.8 −2.2	33.32 +.59	37.4 −0.8	41.32 +.35	43.7 −1.7	51.51 +.74	48.2 −2.0
24.7	21.94 .34	55.0 2.2	33.92 .59	38.5 1.4	41.68 .36	45.6 2.0	52.27 .77	46.4 1.4
34.7	22.28 +.33	57.2 −2.2	34.51 +.57	40.1 −1.9	42.04 +.35	47.7 −2.2	53.05 +.79	45.3 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^2 Camelop. (H.)		α Can. Venaticorum.		θ Virginis.		α Virginis (*Spica*.)	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.
	$12^h\ 48^m$	+83° 59′	$12^h\ 50^m$	+38° 53′	$13^h\ 4^m$	− 4° 57′	$13^h\ 19^m$	−10° 35′
	s	″	s	″	s	″	s	″
(Dec. 30.7)	20.39 +2.23	64.5 −1.0	54.88 +.39	77.3 −1.9	17.18 +.34	19.4 −2.2	25.73 +.34	24.7 −2.1
Jan. 9.7	22.64 2.25	63.9 −0.3	55.27 .39	75.6 1.5	17.52 .33	21.5 2.1	26.07 .34	26.8 2.1
19.7	24.88 2.19	63.9 +0.3	55.66 .38	74.4 1.0	17.85 .32	23.6 2.0	26.40 .33	28.9 2.1
29.7	27.03 2.06	64.5 1.0	56.03 .35	73.7 −0.4	18.16 .30	25.5 1.9	26.72 .31	30.9 2.0
Feb. 8.6	29.00 1.85	65.8 1.6	56.37 .32	73.5 +0.1	18.44 .27	27.3 1.7	27.01 .29	32.8 1.9
18.6	30.73 +1.58	67.7 +2.1	56.67 +.27	73.9 +0.6	18.69 +.24	28.9 −1.5	27.28 +.25	34.6 −1.7
28.6	32.16 1.26	70.0 2.5	56.92 .23	74.7 1.0	18.91 .20	30.2 1.2	27.51 .21	36.2 1.5
Mar. 10.6	33.25 .90	72.7 2.8	57.12 .18	76.0 1.4	19.09 .16	31.3 0.9	27.71 .18	37.5 1.2
20.5	33.96 .51	75.6 3.0	57.27 .13	77.6 1.7	19.24 .12	32.1 0.7	27.87 .14	38.6 1.0
30.5	34.28 +.12	78.7 3.1	57.37 .08	79.5 2.0	19.34 .09	32.7 0.5	27.99 .11	39.5 0.8
Apr. 9.5	34.20 −.26	81.8 +3.0	57.42 +.03	81.5 +2.1	19.42 +.06	33.0 −0.2	28.08 +.08	40.2 −0.6
19.4	33.76 .62	84.8 2.8	57.43 −.01	83.7 2.1	19.46 +.03	33.2 0.0	28.14 .05	40.7 0.4
29.4	32.96 .95	87.5 2.6	57.40 .05	85.8 2.1	19.48 .00	33.1 +0.1	28.17 +.02	40.9 −0.2
May 9.4	31.86 1.23	89.9 2.2	57.34 .08	87.8 2.0	19.47 −.02	33.0 0.2	28.18 −.01	41.1 0.0
19.4	30.50 1.47	92.0 1.8	57.24 .10	89.7 1.8	19.44 .04	32.7 0.3	28.16 .03	41.0 +0.1
29.3	28.92 −1.70	93.5 +1.3	57.13 −.12	91.4 +1.5	19.39 −.06	32.3 +0.4	28.12 −.05	40.9 +0.2
June 8.3	27.19 1.78	94.5 0.8	57.00 .14	92.7 1.2	19.33 .07	31.8 0.5	28.06 .07	40.6 0.3
18.3	25.35 1.86	95.0 +0.2	56.85 .15	93.7 0.8	19.25 .08	31.3 0.5	27.99 .08	40.3 0.4
28.3	23.46 1.89	94.9 −0.3	56.70 .16	94.4 0.5	19.16 .09	30.7 0.6	27.90 .09	39.8 0.5
July 8.2	21.58 1.86	94.3 0.9	56.54 .16	94.7 +0.1	19.06 .10	30.2 0.6	27.81 .10	39.3 0.5
18.2	19.74 −1.79	93.1 −1.4	56.38 −.16	94.6 −0.3	18.96 −.10	29.6 +0.6	27.70 −.11	38.8 +0.6
28.2	18.00 1.68	91.4 2.0	56.23 .15	94.1 0.6	18.85 .10	29.1 0.5	27.59 .11	38.2 0.6
Aug. 7.1	16.38 1.53	89.3 2.4	56.08 .14	93.3 1.0	18.75 .10	28.6 0.5	27.48 .11	37.6 0.6
17.1	14.94 1.34	86.7 2.8	55.95 .12	92.0 1.4	18.65 .09	28.1 0.4	27.37 .10	37.0 0.6
27.1	13.71 1.12	83.7 3.1	55.84 .09	90.5 1.7	18.57 .07	27.7 0.3	27.28 .09	36.5 0.5
Sept. 6.1	12.70 − .87	80.4 −3.4	55.76 −.06	88.6 −2.1	18.50 −.05	27.5 +0.2	27.20 −.07	36.0 +0.4
16.0	11.96 .60	76.8 3.7	55.71 −.03	86.3 2.4	18.46 −.02	27.4 0.0	27.14 .04	35.6 0.3
26.0	11.50 − .31	73.0 3.8	55.70 +.01	83.8 2.6	18.46 +.01	27.5 −0.2	27.12 −.01	35.4 +0.1
Oct. 6.0	11.34 .00	69.1 3.9	55.73 .06	81.1 2.8	18.49 .05	27.8 0.4	27.14 +.04	35.4 −0.1
16.0	11.50 + .32	65.2 3.9	55.82 .11	78.1 3.0	18.56 .09	28.3 0.7	27.19 .08	35.6 0.3
25.9	11.99 + .65	61.3 −3.8	55.95 +.16	75.0 −3.1	18.68 +.14	29.2 −0.9	27.30 +.13	36.0 −0.6
Nov. 4.9	12.81 .98	57.5 3.6	56.13 .21	71.9 3.2	18.84 .18	30.2 1.2	27.45 .17	36.7 0.9
14.9	13.94 1.29	54.0 3.3	56.37 .26	68.7 3.2	19.04 .23	31.6 1.5	27.65 .22	37.7 1.1
24.8	15.38 1.57	50.8 3.0	56.65 .31	65.5 3.0	19.29 .26	33.2 1.7	27.89 .26	39.0 1.4
Dec. 4.8	17.08 1.82	48.0 2.5	56.98 .35	62.6 2.8	19.58 .29	35.0 1.9	28.17 .29	40.6 1.6
14.8	19.02 +2.02	45.8 −2.0	57.35 +.38	59.8 −2.5	19.89 +.32	37.0 −2.0	28.48 +.32	42.3 −1.8
24.8	21.13 2.16	44.1 1.4	57.73 .39	57.4 2.2	20.22 .33	39.1 2.1	28.81 .34	44.3 2.0
34.7	23.34 +2.23	43.0 −0.7	58.13 +.40	55.4 −1.8	20.56 +.34	41.2 −2.1	29.15 +.35	46.3 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Virginis.		η Ursæ Majoris.		η Bootis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 13 29	° ′ − 0 2	h m 13 43	° ′ +49 50	h m 13 49	° ′ +18 56	h m 13 56	° ′ −59 50
	s	″	s	″	s	″	s	″
(Dec. 30.8)	7.04 +.34	14.7 −2.2	13.57 +.44	75.3 −2.2	28.38 +.34	36.5 −2.4	5.35 +.57	28.5 −0.5
Jan. 9.8	7.37 .33	16.9 2.1	14.01 .44	73.3 1.6	28.72 .34	34.2 2.1	5.92 .57	29.3 1.0
19.7	7.70 .32	18.9 1.9	14.46 .44	71.7 1.2	29.06 .33	32.3 1.8	6.49 .56	30.6 1.5
29.7	8.02 .31	20.8 1.7	14.90 .43	70.8 −0.6	29.39 .32	30.7 1.4	7.04 .54	32.3 1.9
Feb. 8.7	8.31 .28	22.4 1.5	15.32 .40	70.5 0.0	29.70 .30	29.4 1.0	7.57 .51	34.4 2.3
18.7	8.58 +.25	23.8 −1.3	15.70 +.36	70.8 +0.5	30.00 +.28	28.7 −0.5	8.06 +.46	36.8 −2.6
28.6	8.82 .22	24.9 1.0	16.05 .32	71.7 1.1	30.26 .25	28.3 −0.1	8.50 .41	39.6 2.8
Mar. 10.6	9.02 .18	25.7 0.7	16.34 .27	73.2 1.6	30.48 .21	28.4 +0.2	8.89 .36	42.4 2.9
20.6	9.19 .15	26.3 0.4	16.58 .21	75.0 2.0	30.67 .17	28.9 0.6	9.22 .30	45.5 3.0
30.5	9.32 .12	26.5 −0.1	16.76 .15	77.2 2.3	30.83 .13	29.6 0.9	9.48 .24	48.5 3.1
Apr. 9.5	9.42 +.08	26.5 +0.1	16.88 +.09	79.7 +2.5	30.94 +.10	30.7 +1.1	9.69 +.18	51.6 −3.0
19.5	9.48 .05	26.4 0.3	16.95 +.04	82.3 2.6	31.02 .07	32.0 1.3	9.84 .12	54.7 2.9
29.5	9.52 +.02	26.0 0.4	16.96 −.01	84.9 2.6	31.07 .04	33.4 1.4	9.93 +.06	57.6 2.8
May 9.4	9.53 .00	25.5 0.5	16.93 .06	87.5 2.5	31.09 +.01	34.9 1.5	9.96 .00	60.3 2.6
19.4	9.52 −.02	25.0 0.6	16.85 .10	89.9 2.3	31.09 −.02	36.4 1.5	9.94 −.05	62.8 2.4
29.4	9.49 −.04	24.3 +0.6	16.73 −.13	92.1 +2.0	31.06 −.04	37.8 +1.4	9.86 −.11	65.1 −2.1
June 8.3	9.44 .06	23.7 0.7	16.58 .16	94.0 1.7	31.00 .06	39.1 1.3	9.72 .16	67.1 1.8
18.3	9.37 .08	23.0 0.6	16.40 .19	95.5 1.3	30.92 .08	40.3 1.1	9.54 .20	68.7 1.4
28.3	9.28 .09	22.4 0.6	16.20 .21	96.6 0.9	30.83 .10	41.3 0.9	9.31 .24	69.9 1.0
July 8.3	9.19 .10	21.8 0.6	15.98 .22	97.3 +0.4	30.72 .11	42.1 0.6	9.05 .26	70.7 0.6
18.2	9.08 −.11	21.2 +0.5	15.75 −.23	97.6 0.0	30.61 −.12	42.6 +0.4	8.76 −.30	71.0 −0.1
28.2	8.97 .11	20.8 0.4	15.51 .23	97.3 −0.5	30.48 .13	43.0 +0.2	8.45 .31	70.9 +0.3
Aug. 7.2	8.86 .11	20.4 0.3	15.28 .23	96.6 0.9	30.35 .13	43.0 −0.1	8.13 .32	70.4 0.7
17.2	8.75 .10	20.1 0.2	15.06 .22	95.4 1.4	30.22 .12	42.8 0.4	7.82 .30	69.4 1.1
27.1	8.66 .09	20.0 +0.1	14.85 .20	93.8 1.8	30.10 .11	42.3 0.7	7.52 .28	68.1 1.5
Sept. 6.1	8.57 −.07	20.0 −0.1	14.67 −.17	91.8 −2.2	29.99 −.10	41.5 −0.9	7.26 −.24	66.4 +1.8
16.1	8.51 .05	20.1 0.3	14.52 .13	89.4 2.6	29.91 .07	40.4 1.2	7.04 .19	64.4 2.1
26.0	8.48 −.02	20.5 0.5	14.41 .09	86.7 2.9	29.85 −.04	39.0 1.5	6.88 .12	62.1 2.3
Oct. 6.0	8.49 +.01	21.1 0.7	14.34 −.04	83.7 3.2	29.82 .00	37.4 1.8	6.80 −.04	59.8 2.4
16.0	8.53 .06	21.9 0.9	14.34 +.02	80.4 3.4	29.84 +.04	35.5 2.0	6.80 +.05	57.4 2.4
26.0	8.62 +.11	23.0 −1.2	14.39 +.09	76.9 −3.5	29.90 +.08	33.3 −2.3	6.88 +.13	55.2 +2.3
Nov. 4.9	8.76 .16	24.3 1.4	14.51 .15	73.3 3.6	30.01 .13	30.9 2.5	7.06 .22	53.0 2.0
14.9	8.94 .20	25.9 1.7	14.69 .21	69.6 3.6	30.17 .18	28.4 2.6	7.33 .31	51.2 1.7
24.9	9.16 .24	27.7 1.9	14.94 .27	66.1 3.5	30.38 .23	25.7 2.7	7.68 .39	49.8 1.3
Dec. 4.8	9.43 .28	29.6 2.0	15.24 .32	62.6 3.3	30.63 .27	23.0 2.7	8.10 .46	48.7 0.8
14.8	9.73 +.31	31.8 −2.1	15.60 +.38	59.5 −3.0	30.92 +.30	20.3 −2.7	8.59 +.53	48.2 +0.3
24.8	10.05 .33	33.9 2.2	16.00 .42	56.6 2.6	31.23 .32	17.7 2.5	9.13 .56	48.1 −0.2
34.8	10.38 +.34	36.1 −2.1	16.43 +.44	54.3 −2.1	31.57 +.34	15.3 −2.3	9.69 +.56	48.6 −0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Draconis.		α Bootis. (*Arcturus*.)		θ Bootis.		ρ Bootis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 14 1	° ′ +64 53	h m 14 10	° ′ +19 44	h m 14 21	° ′ +52 20	h m 14 27	° ′ +30 50
	s	″	s	″	s	″	s	″
(Dec. 30.8)	24.94 +.56	35.0 −2.3	39.96 +.32	56.8 −2.5	27.74 +.42	65.3 −2.6	6.52 +.32	53.3 −2.6
Jan. 9.8	25.53 .60	32.9 1.7	40.29 .33	54.4 2.2	28.17 .44	62.9 2.2	6.86 .35	50.8 2.3
19.8	26.14 .62	31.5 1.1	40.63 .33	52.3 1.9	28.62 .45	61.0 1.6	7.22 .36	48.8 1.8
29.7	26.76 .61	30.7 −0.4	40.96 .32	50.5 1.5	29.08 .45	59.7 1.0	7.57 .35	47.1 1.4
Feb. 8.7	27.36 .58	30.6 +0.2	41.28 .31	49.2 1.1	29.53 .43	59.0 −0.3	7.92 .34	45.9 0.9
18.7	27.92 +.53	31.1 +0.8	41.58 +.29	48.3 −0.6	29.95 +.40	59.0 +0.3	8.25 +.32	45.3 −0.4
28.7	28.43 .47	32.3 1.4	41.85 .26	47.9 −0.2	30.34 .36	59.6 0.9	8.55 .29	45.2 +0.2
Mar. 10.6	28.87 .40	34.0 1.9	42.09 .23	47.9 +0.2	30.68 .32	60.8 1.4	8.82 .25	45.7 0.7
20.6	29.23 .32	36.2 2.3	42.30 .19	48.3 0.6	30.98 .27	62.5 1.9	9.06 .22	46.6 1.1
30.6	29.50 .23	38.7 2.7	42.47 .15	49.0 0.9	31.21 .21	64.6 2.3	9.25 .18	47.9 1.5
Apr. 9.5	29.69 +.14	41.6 +2.9	42.61 +.12	50.1 +1.1	31.40 +.15	67.0 +2.5	9.41 +.14	49.5 +1.7
19.5	29.79 +.05	44.5 3.0	42.71 .08	51.4 1.3	31.52 .09	69.7 2.7	9.53 .10	51.4 1.9
29.5	29.80 −.03	47.5 2.9	42.78 .05	52.8 1.5	31.58 +.04	72.5 2.8	9.62 .06	53.4 2.1
May 9.5	29.73 .11	50.4 2.8	42.81 +.02	54.3 1.5	31.59 −.01	75.2 2.7	9.66 +.03	55.5 2.1
19.4	29.58 .18	53.1 2.6	42.82 −.01	55.9 1.5	31.55 .06	77.9 2.6	9.68 .00	57.7 2.1
29.4	29.37 −.24	55.6 +2.3	42.80 −.03	57.4 +1.4	31.46 −.11	80.4 +2.3	9.66 −.03	59.7 +2.0
June 8.4	29.09 .30	57.7 1.9	42.76 .05	58.8 1.3	31.32 .15	82.6 2.0	9.60 .06	61.6 1.8
18.4	28.77 .34	59.3 1.4	42.69 .07	60.1 1.2	31.15 .19	84.5 1.7	9.53 .09	63.3 1.5
28.3	28.41 .38	60.6 0.9	42.60 .09	61.2 0.9	30.95 .22	86.0 1.3	9.43 .11	64.7 1.2
July 8.3	28.02 .40	61.3 +0.5	42.50 .11	62.0 0.7	30.72 .24	87.1 0.8	9.30 .13	65.8 1.0
18.3	27.61 −.41	61.5 0.0	42.38 −.13	62.6 +0.5	30.47 −.26	87.7 +0.4	9.16 −.15	66.6 +0.6
28.2	27.19 .42	61.2 −0.6	42.24 .14	63.0 +0.2	30.20 .27	87.9 −0.1	9.00 .16	67.1 +0.3
Aug. 7.2	26.77 .41	60.3 1.1	42.11 .14	63.1 0.0	29.93 .27	87.5 0.6	8.84 .17	67.2 −0.1
17.2	26.36 .39	59.0 1.6	41.96 .14	62.9 −0.3	29.66 .26	86.7 1.1	8.67 .17	66.9 0.4
27.2	25.98 .36	57.2 2.0	41.83 .13	62.4 0.6	29.40 .25	85.4 1.5	8.50 .16	66.2 0.8
Sept. 6.1	25.64 −.32	54.9 −2.5	41.70 −.11	61.6 −0.9	29.15 −.23	83.7 −1.9	8.35 −.15	65.2 −1.2
16.1	25.33 .27	52.2 2.9	41.60 .09	60.5 1.2	28.93 .20	81.5 2.3	8.21 .13	63.8 1.5
26.1	25.09 .21	49.2 3.2	41.52 .06	59.1 1.5	28.75 .16	78.9 2.7	8.10 .10	62.0 1.2
Oct. 6.1	24.91 .14	45.8 3.5	41.47 −.03	57.5 1.8	28.62 .11	76.0 3.1	8.02 .06	60.0 2.2
16.0	24.81 −.06	42.2 3.7	41.46 +.01	55.5 2.1	28.54 −.05	72.7 3.3	7.98 −.01	57.6 2.5
26.0	24.80 +.03	38.4 −3.8	41.49 +.05	53.3 −2.3	28.52 +.01	69.3 −3.5	7.99 +.04	54.9 −2.8
Nov. 5.0	24.88 .13	34.5 3.9	41.58 .11	50.9 2.5	28.57 .08	65.6 3.7	8.06 .09	52.0 3.0
14.9	25.05 .22	30.6 3.8	41.71 .16	48.3 2.7	28.69 .15	61.9 3.7	8.17 .14	49.0 3.1
24.9	25.32 .31	26.8 3.7	41.90 .21	45.5 2.8	28.88 .22	58.1 3.7	8.34 .19	45.8 3.2
Dec. 4.9	25.68 .40	23.2 3.5	42.13 .25	42.7 2.8	29.14 .29	54.5 3.6	8.56 .24	42.7 3.1
14.9	26.13 +.48	19.9 −3.1	42.40 +.28	39.9 −2.7	29.45 +.34	51.0 −3.3	8.82 +.28	39.6 −3.0
24.8	26.64 .54	17.0 2.6	42.70 .31	37.2 2.6	29.83 .39	47.9 2.9	9.13 .31	36.6 2.8
34.8	27.20 +.57	14.6 −2.1	43.02 +.33	34.6 −2.4	30.24 +.43	45.1 −2.4	9.46 +.33	33.9 −2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Ursæ Minoris.		α^2 Centauri.		ε Bootis.		α^2 Libræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +76 10	h m 14 32	° ′ −60 22	h m 14 40	° ′ +27 31	h m 14 44	° ′ −15 35
	s	″	s	″	s	″	s	″
(Dec. 30.8)	43.49 +.87	35.8 −2.4	10.12 +.55	59.5 0.0	12.10 +.32	56.2 −2.6	49.03 +.32	12.1 −1.6
Jan. 9.8	44.39 .94	33.6 1.9	10.67 .56	59.8 −0.5	12.43 .33	53.7 2.4	49.36 .33	13.7 1.7
19.8	45.36 .99	32.0 1.2	11.24 .56	60.6 1.0	12.77 .34	51.5 2.0	49.70 .34	15.4 1.7
29.7	46.37 1.00	31.1 −0.5	11.81 .55	61.8 1.4	13.12 .34	49.8 1.5	50.04 .33	17.1 1.7
Feb. 8.7	47.37 .98	30.9 +0.1	12.36 .53	63.4 1.8	13.46 .33	48.4 1.0	50.36 .32	18.8 1.6
18.7	48.33 +.93	31.3 +0.7	12.88 +.50	65.4 −2.1	13.78 +.31	47.7 −0.5	50.68 +.30	20.4 −1.5
28.7	49.22 .84	32.4 1.4	13.37 .46	67.6 2.4	14.09 .29	47.4 0.0	50.97 .28	21.9 1.4
Mar. 10.6	50.02 .73	34.1 1.9	13.80 .41	70.2 2.6	14.36 .26	47.6 +0.5	51.24 .25	23.2 1.2
20.6	50.69 .59	36.2 2.3	14.19 .36	72.9 2.7	14.60 .22	48.3 0.9	51.48 .22	24.4 1.0
30.6	51.21 .45	38.8 2.7	14.53 .30	75.7 2.8	14.80 .19	49.4 1.3	51.69 .19	25.4 0.9
Apr. 9.6	51.58 +.29	41.7 +2.9	14.80 +.24	78.6 −2.9	14.97 +.15	50.9 +1.6	51.87 +.16	26.2 −0.7
19.5	51.79 +.13	44.7 3.0	15.02 .18	81.5 2.9	15.11 .11	52.6 1.8	52.02 .14	26.8 0.5
29.5	51.84 −.03	47.8 3.0	15.17 .12	84.4 2.8	15.20 .06	54.5 2.0	52.14 .11	27.2 0.4
May 9.5	51.73 .18	50.9 2.9	15.27 +.06	87.1 2.7	15.27 .05	56.6 2.0	52.23 .08	27.6 0.2
19.4	51.48 .32	53.8 2.7	15.30 .00	89.7 2.5	15.30 +.01	58.6 2.0	52.29 .05	27.8 −0.1
29.4	51.08 −.45	56.4 +2.5	15.27 −.06	92.1 −2.3	15.29 −.02	60.6 +1.9	52.32 +.02	27.8 0.0
June 8.4	50.57 .56	58.6 2.1	15.19 .11	94.3 2.0	15.26 .05	62.4 1.8	52.33 −.01	27.8 +0.1
18.4	49.96 .66	60.5 1.6	15.04 .17	96.2 1.7	15.20 .07	64.1 1.6	52.31 .03	27.8 0.1
28.3	49.25 .73	61.9 1.1	14.84 .22	97.7 1.3	15.11 .10	65.6 1.3	52.26 .06	27.6 0.2
July 8.3	48.48 .79	62.8 0.6	14.60 .26	98.8 0.9	15.00 .12	66.7 1.0	52.19 .08	27.4 0.2
18.3	47.66 −.83	63.2 +0.1	14.31 −.30	99.6 −0.5	14.87 −.14	67.6 +0.7	52.10 −.10	27.1 +0.3
28.3	46.82 .85	63.0 −0.4	14.00 .33	99.9 −0.1	14.73 .15	68.2 +0.4	51.98 .12	26.7 0.4
Aug. 7.2	45.97 .84	62.3 0.9	13.66 .34	99.8 +0.3	14.57 .16	68.4 0.0	51.85 .13	26.3 0.4
17.2	45.13 .82	61.1 1.4	13.32 .34	99.2 0.7	14.40 .16	68.3 −0.3	51.71 .14	25.9 0.4
27.2	44.32 .78	59.4 1.9	12.98 .33	98.2 1.1	14.24 .16	67.8 0.6	51.57 .14	25.4 0.5
Sept. 6.1	43.57 −.72	57.1 −2.4	12.66 −.30	96.8 +1.5	14.08 −.15	67.0 −1.0	51.44 −.13	25.0 +0.4
16.1	42.89 .63	54.5 2.8	12.38 .26	95.1 1.8	13.94 .13	65.8 1.3	51.32 .11	24.5 0.4
26.1	42.30 .53	51.5 3.2	12.15 .19	93.1 2.1	13.82 .10	64.2 1.7	51.22 .08	24.2 0.3
Oct. 6.1	41.82 .41	48.2 3.5	12.00 .12	90.9 2.2	13.74 .07	62.4 2.0	51.16 −.05	23.9 +0.2
16.0	41.47 .26	44.5 3.7	11.92 −.04	88.6 2.3	13.69 −.02	60.2 2.3	51.13 .00	23.8 0.0
26.0	41.27 −.13	40.7 −3.8	11.92 +.05	86.3 +2.2	13.69 +.03	57.8 −2.6	51.15 +.05	23.8 −0.2
Nov. 5.0	41.22 +.03	36.8 3.9	12.02 .15	84.1 2.1	13.74 .07	55.1 2.8	51.22 .09	24.1 0.4
15.0	41.33 .19	32.9 3.9	12.22 .24	82.1 1.9	13.84 .12	52.2 2.9	51.34 .14	24.6 0.6
24.9	41.60 .36	29.0 3.8	12.51 .33	80.3 1.6	13.99 .18	49.2 3.0	51.51 .19	25.3 0.8
Dec. 4.9	42.04 .52	25.3 3.5	12.88 .41	78.9 1.2	14.19 .23	46.1 3.0	51.73 .24	26.3 1.1
14.9	42.63 +.66	21.9 −3.2	13.32 +.47	78.0 +0.7	14.44 +.27	43.0 −3.0	51.99 +.27	27.5 −1.3
24.8	43.36 .76	18.9 2.8	13.82 .52	77.5 +0.2	14.73 .30	40.1 2.8	52.28 .31	28.9 1.5
34.8	44.21 +.88	16.4 −2.2	14.36 +.55	77.4 −0.2	15.05 +.32	37.4 −2.5	52.60 +.33	30.4 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris. Right Ascension.	β Ursæ Minoris. Declination *North.*	β Bootis. Right Ascension.	β Bootis. Declination *North.*	β Libræ. Right Ascension.	β Libræ. Declination *South.*	μ¹ Bootis. Right Ascension.	μ¹ Bootis. Declination *North.*
	h m 14 50	° ′ +74 35	h m 14 57	° ′ +40 48	h m 15 11	° ′ − 8 58	h m 15 20	° ′ +37 45
	s	″	s	″	s	″	s	″
(Dec.30.8)	59.22 +.74	49.8 −2.7	48.77 +.33	65.3 −2.9	6.57 +.30	45.8 −1.7	20.60 +.31	26.8 −3.0
Jan. 9.8	60.00 .81	47.3 2.2	49.12 .36	62.6 2.5	6.88 .31	47.5 1.7	20.93 .33	24.0 2.6
19.8	60.85 .87	45.4 1.6	49.49 .37	60.3 2.0	7.21 .32	49.2 1.7	21.28 .35	21.5 2.2
29.8	61.74 .90	44.1 0.9	49.87 .38	58.5 1.5	7.53 .32	50.9 1.6	21.64 .36	19.5 1.7
Feb. 8.7	62.65 .90	43.6 −0.2	50.25 .37	57.2 0.9	7.86 .32	52.5 1.5	22.00 .36	18.1 1.2
18.7	63.54 +.86	43.7 +0.4	50.62 +.36	56.6 −0.3	8.17 +.30	53.9 −1.3	22.36 +.35	17.2 −0.6
28.7	64.37 .80	44.5 1.0	50.96 .33	56.6 +0.3	8.47 .28	55.2 1.1	22.70 .33	16.9 0.0
Mar. 10.7	65.14 .71	45.8 1.6	51.28 .30	57.1 0.8	8.74 .26	56.2 0.9	23.02 .30	17.2 +0.6
20.6	65.80 .61	47.8 2.1	51.57 .26	58 2 1.3	8.99 .24	57.0 0.7	23.32 .27	18.0 1.1
30.6	66.34 .48	50.2 2.5	51.81 .22	59.8 1.7	9.22 .21	57.6 0.5	23.57 .24	19.4 1.5
Apr. 9.6	66.76 +.34	52.9 +2 8	52.01 +.18	61.7 +2.1	9.42 +.18	58.0 −0.3	23.79 +.20	21.1 +1.9
19.5	67.03 .20	55.9 3.0	52.17 .13	64.0 2.3	9.59 .16	58.1 −0.1	23.97 .16	23.2 2.2
29.5	67.16 +.06	59.0 3 1	52.29 .09	66.4 2.5	9.73 .13	58.1 +0.1	24.11 .12	25.6 2.4
May 9.5	67.14 −.06	62.1 3.0	52.36 .05	68.9 2.6	9.84 .10	58.0 0.2	24.21 .08	28.0 2.5
19.5	66.99 .22	65.0 2.9	52.39 +.01	71.5 2.5	9.93 .07	57.8 0.3	24.27 +.04	30.6 2.5
29.4	66.71 −.34	67.8 +2.7	52.38 −.03	74.0 +2.4	9.98 +.04	57.4 +0.3	24.29 .00	33.1 +2.4
June 8.4	66.31 .45	70.3 2.3	52.33 .07	76.3 [illegible]	10.01 +.01	57.0 0.4	24.27 −.04	35.5 2.3
18.4	65.81 .54	72.5 1.9	52.24 .10	78.4 1.9	10.01 −.02	56.6 0.4	24.22 .07	37.6 2.1
28.4	65.22 .62	74.2 1.5	52.13 .13	80.2 1.6	9.98 .04	56.2 0.4	24.12 .11	39.6 1.8
July 8.3	64.56 .69	75.4 1.0	51.98 .16	81.6 1.3	9.92 .07	55.8 0.4	24.00 .14	41.2 1.4
18.3	63.85 −.73	76.1 +0.5	51.81 −.18	82.7 +0.9	9.84 −.08	55.4 0.4	23.85 −.16	42.5 +1.1
28.3	63.09 .76	76.3 0.0	51.62 .20	83.4 +0.4	9.73 .11	55.0 0.4	23.67 .18	43.4 0.7
Aug. 7.3	62.32 .78	76.0 −0.6	51.41 .21	83.6 0.0	9.61 .13	54.6 0.4	23.48 .20	43.9 +0.3
17.2	61.54 .77	75.1 1.1	51.19 .22	83.4 −0.4	9.47 .14	54.2 0.3	23.27 .21	44.0 −0.1
27.2	60.78 .74	73.7 1.6	50.97 .21	82.8 0.8	9.33 .14	53.9 0.3	23.06 .21	43.6 0.6
Sept. 6.2	60.05 −.70	71.8 −2.1	50.76 −.20	81.7 −1.2	9.19 −.13	53.7 +0.2	22.84 −.20	42.8 −1.0
16.1	59.38 .63	69.5 2.5	50.57 .18	80.2 1.7	9.06 .12	53.5 +0.1	22.64 .19	41.6 1.4
26.1	58.78 .55	66.8 2.9	50.40 .15	78.3 2.1	8.94 .10	53.5 0.0	22.46 .17	40.0 1.8
Oct. 6.1	58.27 .45	63.6 3.3	50.26 .12	76.0 2.5	8.86 .07	53.5 −0.1	22.31 .13	38.0 2.2
16.1	57.88 .33	60.2 3.6	50.16 .07	73.4 2.8	8.81 −.03	53.8 0.3	22.20 .09	35.6 2.5
26.0	57.60 −.20	56.5 −3.8	50.12 −.02	70.4 −3.1	8.80 +.02	54.2 −0.5	22.13 −.04	32.9 −2.8
Nov. 5.0	57.47 −.06	52.6 3.9	50.13 +.04	67.2 3.3	8.84 .06	54.8 0.7	22.12 +.01	29.9 3.1
15.0	57.49 +.09	48.7 3.9	50.20 .10	63.8 3.4	8.93 .11	55.6 0.9	22.16 .07	26.7 3.3
24.9	57.65 .24	44.8 3.8	50.33 .16	60.4 3.5	9.07 .16	56.7 1.1	22.26 .13	23.3 3.4
Dec. 4.9	57.97 .39	41.0 3.7	50.52 .22	56.8 3.4	9.26 .21	58.0 1.3	22.42 .18	19.9 3.4
14.9	58.44 +.53	37.4 −3.4	50.76 +.27	53.4 −3.3	9.49 +.25	59.4 −1.5	22.63 +.24	16.5 −3.3
24.9	59.03 .65	34.2 3.0	51.06 .31	50.2 3.1	9.76 .28	61.0 1.6	22.89 .28	13.2 3.1
34.8	59.74 +.76	31.4 −2.5	51.39 +.34	47.2 −2.8	10.06 +.30	62.7 −1.7	23.20 +.32	10.2 −2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ² Ursæ Minoris.		α Coronæ Borealis.		α Serpentis.		ε Serpentis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 15 20	° ′ +72 12	h m 15 30	° ′ +27 4	h m 15 38	° ′ + 6 45	h m 15 45	° ′ + 4 48
	s	″	s	″	s	″	s	″
(Dec. 30.9)	51.68 +.59	66.0 −3.0	2.58 +.29	48.5 −2.9	52.04 +.27	66.5 −2.2	21.01 +.27	21.6 −2.1
Jan. 9.8	52.31 .66	63.2 2.5	2.88 .31	45.7 2.6	52.32 .29	64.3 2.1	21.30 .29	19.5 2.0
19.8	53.01 .73	60.9 2.0	3.20 .32	43.3 2.2	52.62 .31	62.2 2.0	21.60 .30	17.4 1.9
29.8	53.77 .77	59.2 1.4	3.54 .33	41.3 1.8	52.94 .31	60.4 1.7	21.91 .31	15.6 1.7
Feb. 8.8	54.56 .79	58.2 −0.7	3.87 .33	39.7 1.3	53.25 .31	58.7 1.4	22.22 .31	14.0 1.4
18.7	55.35 +.77	57.8 0.0	4.20 +.32	38.6 −0.8	53.56 +.30	57.4 −1.1	22.53 +.30	12.7 −1.1
28.7	56.11 .73	58.2 +0.7	4.52 .31	38.0 −0.3	53.86 .29	56.5 0.8	22.83 .29	11.8 0.8
Mar. 10.7	56.82 .67	59.2 1.3	4.82 .29	38.0 +0.2	54.15 .27	55.9 −0.4	23.12 .28	11.1 0.4
20.7	57.46 .60	60.8 1.8	5.10 .26	38.4 0.7	54.41 .25	55.7 0.0	23.38 .26	10.9 −0.1
30.6	58.01 .50	62.9 2.3	5.34 .23	39.3 1.1	54.65 .23	55.8 +0.3	23.63 .23	10.9 +0.2
Apr. 9.6	58.45 +.40	65.4 +2.7	5.56 +.20	40.6 +1.5	54.86 +.20	56.3 +0.6	23.85 +.20	11.3 +0.5
19.6	58.78 .27	68.2 2.9	5.74 .17	42.3 1.8	55.05 .17	57.0 0.8	24.04 .18	11.9 0.7
29.5	58.98 .15	71.3 3.1	5.89 .13	44.2 2.0	55.21 .15	57.9 1.0	24.21 .15	12.8 0.9
May 9.5	59.07 +.03	74.4 3.1	6.00 .10	46.3 2.1	55.34 .12	59.0 1.1	24.35 .12	13.7 1.1
19.5	59.04 −.09	77.5 3.0	6.08 .06	48.4 2.2	55.44 .09	60.2 1.2	24.46 .09	14.8 1.1
29.5	58.88 −.20	80.5 +2.9	6.13 +.03	50.6 +2.1	55.52 +.06	61.5 +1.2	24.54 +.06	16.0 +1.2
June 8.4	58.62 .31	83.2 2.6	6.14 .00	52.7 2.0	55.56 +.03	62.7 1.2	24.58 +.03	17.2 1.2
18.4	58.26 .40	85.7 2.3	6.12 −.04	54.6 1.9	55.57 .00	64.0 1.2	24.60 .00	18.3 1.1
28.4	57.82 .49	87.7 1.9	6.06 .07	56.4 1.7	55.55 −.03	65.1 1.1	24.59 −.03	19.4 1.0
July 8.4	57.29 .56	89.4 1.4	5.98 .10	57.9 1.4	55.50 .06	66.1 1.0	24.55 .06	20.4 0.9
18.3	56.70 −.61	90.5 +0.9	5.86 −.13	59.2 +1.1	55.42 −.09	67.0 +0.8	24.47 −.09	21.2 +0.8
28.3	56.06 .65	91.2 +0.4	5.72 .15	60.1 0.8	55.32 .11	67.7 0.6	24.37 .11	22.0 0.6
Aug. 7.3	55.39 .68	91.3 −0.1	5.56 .16	60.7 0.4	55.20 .13	68.3 0.4	24.25 .13	22.5 0.5
17.2	54.70 .70	91.0 0.6	5.39 .17	61.0 +0.1	55.06 .15	68.6 0.3	24.12 .14	22.9 0.3
27.2	54.01 .68	90.0 1.1	5.21 .18	60.8 −0.3	54.91 .16	68.8 +0.1	23.97 .15	23.1 +0.1
Sept. 6.2	53.33 −.65	88.6 −1.6	5.03 −.18	60.4 −0.7	54.75 −.15	68.8 −0.1	23.81 −.15	23.1 −0.1
16.2	52.70 .61	86.7 2.1	4.86 .17	59.5 1.0	54.61 .14	68.5 0.3	23.66 .14	22.9 0.3
26.1	52.11 .55	84.3 2.6	4.70 .15	58.3 1.4	54.47 .12	68.0 0.6	23.53 .12	22.5 0.5
Oct. 6.1	51.59 .47	81.5 3.0	4.57 .12	56.7 1.7	54.36 .10	67.3 0.9	23.41 .10	21.9 0.7
16.1	51.16 .37	78.4 3.3	4.47 .08	54.8 2.1	54.28 .06	66.3 1.1	23.33 .06	21.0 1.0
26.1	50.84 −.27	74.9 −3.6	4.42 −.03	52.6 −2.4	54.24 −.02	65.1 −1.3	23.29 −.02	19.9 −1.2
Nov. 5.0	50.63 .15	71.2 3.8	4.41 +.03	50.0 2.6	54.25 +.03	63.6 1.6	23.28 +.03	18.5 1.5
15.0	50.55 −.02	67.4 3.9	4.45 .07	47.3 2.8	54.30 .08	61.9 1.8	23.33 .07	17.0 1.7
25.0	50.60 +.12	63.4 3.9	4.55 .12	44.3 3.0	54.40 .13	60.0 2.0	23.43 .12	15.2 1.9
Dec. 4.9	50.79 .26	59.6 3.8	4.70 .17	41.3 3.1	54.55 .17	57.9 2.1	23.58 .17	13.2 2.0
14.9	51.12 +.39	55.8 −3.6	4.90 +.22	38.2 −3.0	54.75 +.22	55.7 −2.2	23.77 +.21	11.2 −2.1
24.9	51.56 .51	52.4 3.3	5.14 .26	35.2 2.9	54.99 .25	53.5 2.2	24.00 .25	9.0 2.2
34.9	52.13 +.61	49.3 −2.9	5.42 +.30	32.3 −2.8	55.26 +.28	51.2 −2.2	24.27 +.28	6.9 −2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ursæ Minoris.		ε Coronæ Borealis.		δ Scorpii.		β^1 Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 15 47	+78° 7′	h m 15 53	+27° 11′	h m 15 53	−22° 18′	h m 15 59	−19° 30′
	s	″	s	″	s	″	s	″
(Dec. 30.9)	53.89+ .70	34.2 −3.1	2.65 +.26	31.8 −2.9	51.03 +.29	34.4 −0.9	3.70 +.28	19.8 −1.0
Jan. 9.9	54.66 .84	31.3 2.7	2.93 .29	29.0 2.7	51.34 .31	35.4 1.0	4.00 .31	20.8 1.1
19.8	55.57 .96	28.8 2.2	3.24 .31	26.4 2.3	51.66 .33	36.4 1.1	4.32 .32	22.0 1.2
29.8	56.59 1.05	26.9 1.6	3.56 .33	24.3 1.9	52.00 .34	37.6 1.2	4.65 .33	23.2 1.2
Feb. 8.8	57.68 1.10	25.6 0.9	3.89 .33	22.6 1.5	52.34 .34	38.8 1.2	4.99 .33	24.5 1.2
18.7	58.80+1.12	25.0 −0.3	4.22 +.32	21.3 −1.0	52.68 +.33	40.1 −1.2	5.32 +.33	25.7 −1.2
28.7	59.91 1.08	25.0 +0.4	4.54 .31	20.7 −0.4	53.01 .32	41.3 1.1	5.64 .32	26.8 1.1
Mar. 10.7	60.97 1.02	25.8 1.0	4.85 .29	20.5 +0.1	53.32 .30	42.4 1.1	5.95 .30	27.8 1.0
20.7	61.95 .92	27.1 1.6	5.14 .27	20.8 0.6	53.62 .28	43.4 1.0	6.25 .28	28.8 0.9
30.6	62.81 .79	29.0 2.1	5.40 .25	21.7 1.0	53.89 .26	44.3 0.9	6.52 .26	29.6 0.7
Apr. 9.6	63.52+ .63	31.3 +2.5	5.63 +.22	22.9 +1.4	54.14 +.24	45.1 −0.8	6.77 +.24	30.2 −0.6
19.6	64.08 .48	34.0 2.8	5.83 .19	24.5 1.8	54.37 .21	45.8 0.7	6.99 .21	30.8 0.5
29.6	64.46 .29	37.0 3.0	6.00 .16	26.4 2.0	54.56 .18	46.4 0.6	7.19 .18	31.2 0.4
May 9.5	64.65+ .11	40.1 3.1	6.14 .12	28.5 2.1	54.73 .15	47.0 0.5	7.36 .16	31.5 0.3
19.5	64.66− .09	43.3 3.1	6.25 .08	30.7 2.2	54.87 .12	47.4 0.4	7.50 .13	31.8 0.2
29.5	64.49− .26	46.3 +3.0	6.31 +.05	33.0 +2.2	54.98 +.09	47.8 −0.3	7.61 +.09	32.0 −0.2
June 8.4	64.15 .43	49.2 2.7	6.35 +.01	35.2 2.1	55.05 .06	48.1 0.3	7.69 .06	32.1 0.1
18.4	63.64 .58	51.8 2.4	6.34 −.02	37.3 2.0	55.09 +.02	48.3 0.2	7.73 +.02	32.2 −0.1
28.4	62.99 .72	54.1 2.1	6.30 .05	39.2 1.8	55.09 −.01	48.5 0.2	7.74 −.01	32.3 0.0
July 8.4	62.21 .83	56.0 1.6	6.23 .09	40.9 1.5	55.06 .05	48.7 −0.1	7.71 .04	32.3 0.0
18.3	61.32− .93	57.4 +1.2	6.13 −.12	42.3 +1.2	55.00 −.08	48.7 0.0	7.65 −.08	32.2 +0.1
28.3	60.34 1.01	58.4 0.7	6.00 .14	43.4 0.9	54.90 .11	48.7 +0.1	7.56 .11	32.2 0.1
Aug. 7.3	59.30 1.06	58.8 +0.2	5.84 .16	44.2 0.6	54.77 .13	48.6 0.1	7.44 .13	32.0 0.2
17.3	58.22 1.09	58.8 −0.3	5.67 .18	44.6 +0.3	54.63 .15	48.4 0.2	7.30 .15	31.8 0.2
27.2	57.12 1.09	58.2 0.8	5.48 .19	44.7 −0.1	54.47 .16	48.2 0.3	7.14 .16	31.6 0.3
Sept. 6.2	56.03−1.07	57.1 −1.3	5.29 −.19	44.4 −0.5	54.31 −.16	47.8 +0.4	6.98 −.16	31.3 +0.3
16.2	54.97 1.02	55.5 1.8	5.10 .18	43.7 0.9	54.15 .15	47.5 0.4	6.83 .15	31.0 0.3
26.1	53.98 .95	53.4 2.3	4.93 .16	42.6 1.2	54.00 .13	47.1 0.4	6.68 .13	30.7 0.3
Oct. 6.1	53.08 .84	50.9 2.7	4.78 .13	41.2 1.6	53.88 .10	46.6 0.4	6.56 .11	30.4 0.3
16.1	52.29 .72	48.0 3.1	4.66 .10	39.4 1.9	53.79 .07	46.2 0.3	6.47 .07	30.1 0.2
26.1	51.65− .57	44.7 −3.4	4.58 −.06	37.3 −2.3	53.75 −.02	45.9 +0.2	6.42 −.03	29.9 +0.1
Nov. 5.0	51.16 .40	41.2 3.6	4.55 −.01	34.9 2.6	53.75 +.03	45.7 +0.1	6.41 +.02	29.9 0.0
15.0	50.85 .21	37.5 3.8	4.56 +.04	32.2 2.8	53.80 .08	45.6 0.0	6.46 .07	30.0 −0.2
25.0	50.74− .01	33.7 3.8	4.63 .10	29.3 2.9	53.91 .13	45.8 −0.2	6.56 .13	30.2 0.4
Dec. 5.0	50.82+ .19	29.8 3.8	4.76 .15	26.3 3.0	54.07 .18	46.1 0.4	6.72 .18	30.7 0.6
14.9	51.11+ .38	26.1 −3.6	4.93 +.20	23.2 −3.0	54.28 +.23	46.6 −0.6	6.92 +.22	31.3 −0.7
24.9	51.59 .57	22.5 3.4	5.16 .24	20.2 3.0	54.54 .27	47.2 0.8	7.16 .26	32.2 0.9
34.9	52.26+ .75	19.3 −3.0	5.42 +.27	17.2 −2.8	54.83 +.31	48.1 −1.0	7.45 +.29	33.1 −1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		τ Herculis.		η Draconis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 16 5	° ′ +68 5	h m 16 8	° ′ − 3 24	h m 16 16	° ′ +46 34	h m 16 22	° ′ +61 45
	s	″	s	″	s	″	s	″
(Dec.30.9)	58.56 +.40	39.6 −3.4	35.91 +.26	47.3 −1.8	25.76 +.26	14.1 −3.4	28.52 +.31	29.5 −3.5
Jan. 9.9	59.00 .48	36.4 3.0	36.18 .28	49.0 1.7	26.05 .33	10.9 3.0	28.87 .38	26.1 3.2
19.8	59.52 .55	33.6 2.5	36.47 .30	50.8 1.7	26.38 .35	8.0 2.6	29.28 .44	23.2 2.7
29.8	60.11 .60	31.4 2.0	36.78 .31	52.4 1.6	26.74 .37	5.6 2.1	29.74 .49	20.7 2.2
Feb. 8.8	60.73 .63	29.7 1.3	37.09 .31	53.8 1.4	27.13 .38	3.7 1.6	30.25 .51	18.8 1.6
18.8	61.38 +.64	28.8 −0.6	37.40 +.31	55.1 −1.1	27.52 +.39	2.4 −1.0	30.77 +.52	17.6 −0.9
28.7	62.03 .64	28.5 0.0	37.71 .30	56.1 0.9	27.91 .38	1.7 −0.3	31.29 .52	17.0 −0.2
Mar. 10.7	62.66 .61	28.8 +0.7	38.00 .28	56.9 0.6	28.28 .37	1.7 +0.3	31.81 .50	17.1 +0.4
20.7	63.24 .56	29.9 1.3	38.28 .27	57.4 0.3	28.64 .34	2.3 0.9	32.30 .47	17.8 1.1
30.7	63.77 .50	31.5 1.9	38.54 .25	57.6 −0.1	28.97 .31	3.5 1.4	32.75 .42	19.2 1.7
Apr. 9.6	64.23 +.42	33.6 +2.3	38.78 +.23	57.6 +0.2	29.27 +.28	5.2 +1.9	33.15 +.37	21.2 +2.2
19.6	64.61 .33	36.2 2.7	39.00 .20	57.3 0.4	29.53 .24	7.3 2.3	33.49 .31	23.5 2.6
29.6	64.90 .24	39.0 3.0	39.19 .18	56.8 0.5	29.74 .19	9.8 2.6	33.76 .24	26.3 2.9
May 9.5	65.09 .14	42.1 3.1	39.36 .15	56.2 0.6	29.91 .14	12.6 2.8	33.97 .17	29.3 3.1
19.5	65.18 +.05	45.3 3.2	39.49 .12	55.5 0.7	30.03 .10	15.4 2.9	34.10 .09	32.4 3.1
29.5	65.18 −.05	48.4 +3.1	39.60 +.09	54.8 +0.8	30.10 +.05	18.4 +2.9	34.15 +.03	35.5 +3.1
June 8.5	65.08 .14	51.5 2.9	39.67 .06	54.0 0.8	30.12 .00	21.2 2.8	34.13 −.02	38.6 3.0
18.4	64.89 .23	54.3 2.7	39.72 +.02	53.2 0.8	30.09 −.05	24.0 2.6	34.04 .13	41.6 2.8
28.4	64.62 .31	56.9 2.4	39.72 −.01	52.4 0.7	30.02 .10	26.5 2.4	33.87 .20	44.3 2.5
July 8.4	64.27 .39	59.1 2.0	39.70 .04	51.7 0.7	29.90 .14	28.7 2.1	33.64 .26	46.7 2.2
18.4	63.85 −.45	60.8 +1.5	39.65 −.07	51.1 +0.6	29.74 −.18	30.6 +1.7	33.35 −.31	48.7 +1.8
28.3	63.37 .50	62.2 1.1	39.56 .10	50.5 0.5	29.54 .22	32.1 1.3	33.01 .36	50.3 1.3
Aug. 7.3	62.85 .54	63.0 0.6	39.45 .12	50.0 0.4	29.30 .24	33.2 0.8	32.63 .40	51.4 0.9
17.3	62.29 .57	63.4 +0.1	39.32 .14	49.7 0.3	29.05 .26	33.8 +0.4	32.21 .43	52.0 +0.4
27.2	61.71 .58	63.2 −0.4	39.17 .15	49.4 0.2	28.77 .28	34.0 −0.1	31.77 .44	52.1 −0.1
Sept. 6.2	61.13 −.58	62.5 −1.0	39.02 −.15	49.3 +0.1	28.49 −.28	33.6 −0.6	31.32 −.45	51.7 −0.7
16.2	60.55 .56	61.2 1.5	38.86 .15	49.3 −0.1	28.21 .27	32.8 1.0	30.87 .44	50.8 1.2
26.2	60.01 .52	59.5 2.0	38.72 .13	49.4 0.2	27.94 .26	31.6 1.5	30.44 .42	49.4 1.7
Oct. 6.1	59.51 .47	57.3 2.4	38.59 .11	49.7 0.4	27.70 .23	29.8 2.0	30.04 .38	47.5 2.2
16.1	59.07 .40	54.7 2.8	38.50 .08	50.2 0.6	27.49 .19	27.6 2.4	29.69 .33	45.1 2.6
26.1	58.71 −.32	51.6 −3.2	38.44 −.04	50.8 −0.8	27.32 −.14	25.1 −2.6	29.39 −.26	42.3 −3.0
Nov. 5.1	58.44 .22	48.3 3.5	38.42 +.01	51.7 1.0	27.21 .08	22.1 3.1	29.16 .18	39.2 3.3
15.0	58.26 .12	44.7 3.7	38.45 .06	52.7 1.1	27.16 −.02	18.9 3.3	29.02 .10	35.7 3.6
25.0	58.20 −.01	40.9 3.8	38.53 .11	54.0 1.3	27.16 +.04	15.4 3.5	28.96 −.01	32.0 3.8
Dec. 5.0	58.25 +.11	37.0 3.9	38.66 .15	55.4 1.5	27.24 .11	11.8 3.6	28.99 +.08	28.2 3.8
14.9	58.42 +.22	33.1 −3.8	38.84 +.20	57.0 −1.6	27.38 +.17	8.2 −3.6	29.12 +.17	24.3 −3.8
24.9	58.70 .33	29.4 3.6	39.06 .24	58.6 1.7	27.59 .23	4.6 3.5	29.33 .25	20.6 3.6
34.9	59.08 +.43	26.0 −3.3	39.31 +.27	60.4 −1.8	27.85 +.29	1.2 −3.3	29.63 +.34	17.0 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Scorpii. (*Antares.*)		*β* Herculis.		A Draconis.		*ζ* Ophiuchi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 22	° ′ −26 11	h m 16 25	° ′ +21 43	h m 16 28	° ′ +68 59	h m 16 31	° ′ −10 20
	s	″	s	″	s	″	s	″
(Dec.30.9)	40.98 +.28	18.2 −0.5	30.02 +.24	34.0 −2.8	9.02 +.35	63.4 −3.5	7.16 +.25	44.2 −1.3
Jan. 9.9	41.27 .31	18.8 0.7	30.28 .26	31.3 2.6	9.42 .45	60.0 3.2	7.42 .27	45.5 1.3
19.9	41.59 .33	19.5 0.8	30.55 .29	28.9 2.3	9.91 .53	57.0 2.7	7.71 .29	46.9 1.3
29.8	41.93 .34	20.4 0.9	30.85 .31	26.7 2.0	10.48 .59	54.6 2.2	8.02 .31	48.2 1.3
Feb. 8.8	42.28 .35	21.3 0.9	31.17 .32	24.8 1.6	11.10 .64	52.7 1.5	8.33 .31	49.5 1.2
18.8	42.62 +.34	22.3 −1.0	31.48 +.32	23.5 −1.1	11.76 +.66	51.4 −0.9	8.64 +.31	50.6 −1.0
28.7	42.96 .34	23.2 1.0	31.80 .31	22.6 0.7	12.43 .66	50.8 −0.2	8.96 .31	51.5 0.8
Mar. 10.7	43.30 .33	24.2 0.9	32.10 .30	22.2 −0.2	13.08 .64	50.9 +0.4	9.26 .30	52.3 0.7
20.7	43.62 .31	25.1 0.9	32.40 .28	22.2 +0.3	13.71 .60	51.7 1.1	9.56 .29	52.9 0.5
30.7	43.92 .29	25.9 0.8	32.67 .26	22.8 0.8	14.29 .54	53.1 1.7	9.83 .27	53.2 0.3
Apr. 9.6	44.20 +.27	26.7 −0.7	32.92 +.24	23.8 +1.2	14.80 +.47	55.0 +2.2	10.09 +.25	53.4 −0.1
19.6	44.45 .24	27.4 0.7	33.15 .21	25.1 1.5	15.23 .39	57.4 2.6	10.33 .23	53.4 +0.1
29.6	44.68 .22	28.1 0.6	33.34 .18	26.8 1.8	15.58 .30	60.2 2.9	10.55 .20	53.2 0.2
May 9.6	44.89 .19	28.7 0.6	33.51 .15	28.6 1.9	15.83 .20	63.2 3.1	10.74 .18	52.9 0.3
19.5	45.06 .16	29.3 0.5	33.65 .12	30.7 2.0	15.98 +.09	66.4 3.2	10.90 .15	52.5 0.4
29.5	45.20 +.12	29.8 −0.5	33.76 +.09	32.8 +2.1	16.02 −.02	69.6 +3.1	11.04 +.12	52.1 +0.5
June 8.5	45.30 .08	30.3 0.5	33.82 .05	34.8 2.0	15.97 .11	72.7 3.0	11.14 .08	51.6 0.5
18.4	45.37 .05	30.8 0.4	33.86 +.01	36.9 1.9	15.81 .20	75.7 2.9	11.20 .05	51.1 0.5
28.4	45.40 +.01	31.2 0.4	33.85 −.02	38.8 1.8	15.57 .29	78.4 2.6	11.24 +.01	50.6 0.4
July 8.4	45.39 −.03	31.5 0.3	33.82 .06	40.5 1.6	15.23 .37	80.8 2.2	11.23 −.02	50.2 0.4
18.4	45.34 −.07	31.8 −0.2	33.74 −.09	42.0 +1.4	14.82 −.45	82.9 +1.8	11.19 −.05	49.8 +0.4
28.3	45.26 .10	32.0 0.2	33.63 .12	43.3 1.1	14.34 .51	84.5 1.4	11.12 .09	49.5 0.3
Aug. 7.3	45.14 .13	32.1 −0.1	33.50 .14	44.2 0.8	13.80 .56	85.6 0.9	11.02 .12	49.2 0.3
17.3	45.00 .15	32.1 +0.1	33.34 .16	44.9 0.5	13.22 .59	86.3 +0.4	10.89 .14	48.9 0.2
27.3	44.84 .17	32.0 0.2	33.17 .18	45.2 +0.2	12.61 .61	86.4 −0.1	10.75 .15	48.7 0.2
Sept. 6.2	44.66 −.17	31.8 +0.3	32.98 −.19	45.2 −0.2	11.99 −.62	86.1 −0.6	10.59 −.16	48.5 +0.1
16.2	44.49 .17	31.5 0.4	32.80 .18	44.9 0.5	11.37 .61	85.2 1.2	10.43 .15	48.4 +0.1
26.2	44.33 .16	31.1 0.4	32.62 .17	44.2 0.9	10.77 .58	83.8 1.7	10.28 .14	48.4 0.0
Oct. 6.1	44.18 .13	30.6 0.5	32.46 .15	43.2 1.2	10.21 .53	81.8 2.1	10.14 .12	48.5 −0.1
16.1	44.07 .09	30.2 0.5	32.32 .12	41.8 1.5	9.70 .47	79.4 2.6	10.03 .09	48.6 0.2
26.1	43.99 −.05	29.7 +0.4	32.23 −.08	40.0 −1.9	9.27 −.40	76.7 −3.0	9.95 −.05	48.9 −0.4
Nov. 5.1	43.97 .00	29.3 0.4	32.17 −.03	38.0 2.2	8.93 .30	73.5 3.3	9.92 −.01	49.4 0.5
15.0	43.99 +.05	29.0 0.3	32.16 +.02	35.7 2.4	8.68 .19	70.0 3.6	9.93 +.04	49.9 0.7
25.0	44.08 .11	28.7 +0.1	32.20 .07	33.2 2.6	8.55 −.07	66.3 3.8	9.99 .09	50.7 0.8
Dec. 5.0	44.21 .16	28.7 −0.1	32.29 .12	30.5 2.7	8.54 +.06	62.5 3.8	10.11 .14	51.6 1.0
15.0	44.40 +.21	28.8 −0.2	32.44 +.17	27.7 −2.8	8.64 +.16	58.6 −3.8	10.27 +.18	52.7 −1.1
24.9	44.64 .26	29.1 0.4	32.63 .21	24.8 2.8	8.86 .26	54.9 3.7	10.48 .22	53.9 1.2
34.9	44.91 +.29	29.6 −0.6	32.86 +.25	22.0 −2.7	9.20 +.36	51.3 −3.4	10.72 +.25	55.2 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Trianguli Australis.		η Herculis.		κ Ophiuchi.		ε Ursæ Minoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$16^{h}\ 37^{m}$	$-68^{\circ}\ 49'$	$16^{h}\ 39^{m}$	$+39^{\circ}\ 7'$	$16^{h}\ 52^{m}$	$+\ 9^{\circ}\ 32'$	$16^{h}\ 56^{m}$	$+82^{\circ}\ 12'$
	s	″	s	″	s	″	s	″
(Dec.30.9)	2.28 +.55	25.7 +1.7	7.38 +.23	40.0 −3.3	28.40 +.21	38.6 −2.3	62.48+ .58	47.6 −3.5
Jan. 9.9	2.87 .63	24.1 1.4	7.63 .27	36.8 3.0	28.63 .24	36.4 2.2	63.14 .80	44.3 3.2
19.9	3.54 .69	22.9 1.0	7.92 .30	33.9 2.7	28.89 .27	34.3 2.0	64.08 1.06	41.2 2.8
29.8	4.26 .74	22.2 0.5	8.23 .33	31.3 2.3	29.17 .29	32.3 1.8	65.27 1.28	38.6 2.3
Feb. 8.8	5.02 .77	21.8 +0.1	8.57 .35	29.3 1.8	29.46 .30	30.7 1.5	66.65 1.45	36.5 1.8
18.8	5.80 +.78	21.9 −0.3	8.93 +.35	27.8 −1.2	29.76 +.30	29.3 −1.2	68.17+1.56	35.1 −1.2
28.7	6.58 .77	22.4 0 7	9.28 .35	26.9 −0.6	30.06 .30	28.3 0.8	69.78 1.62	34.2 −0.5
Mar. 10.7	7.35 .76	23.2 1.0	9.63 .34	26 6 0.0	30.36 .29	27.7 −0.4	71.41 1.61	34.0 +0.1
20.7	8.09 .73	24.4 1.4	9.96 .32	26.8 +0.6	30.65 .28	27.5 0.0	73.00 1.54	34.5 0.8
30.7	8.80 .68	26.0 1.7	10.28 .30	27.7 1.1	30.93 .27	27.7 +0.4	74.50 1.42	35.6 1.4
Apr. 9.6	9.46 +.63	27.9 −2.0	10.57 +.27	29.1 +1.6	31.19 +.25	28.3 +0.7	75.85+1.25	37.3 +1.9
19.6	10.06 .57	30.0 2.2	10.83 .24	30.9 2.0	31.44 .23	29.2 1.0	77.00 1.04	39.4 2.3
29.6	10.60 .50	32.3 2.4	11.05 .21	33.1 2.3	31.65 .21	30.3 1.2	77.94 .80	42.0 2.7
May 9.5	11.07 .42	34.8 2 5	11.24 .17	35.6 2.6	31.85 .18	31.6 1.4	78.61 .54	44.8 2.9
19.5	11.45 .34	37.4 2.6	11.39 .12	38.3 2.7	32.02 .15	33.1 1.5	79.01+ .26	47.8 3.1
29.5	11.74 +.24	40.1 −2.7	11.50 +.08	41.1 +2.8	32.15 +.12	34.7 +1.6	79.14− .02	51.0 +3.1
June 8.5	11.94 .15	42.8 2.7	11.56 +.04	43.8 2.7	32.26 .09	36.4 1.6	78.97 .30	54.1 3.0
18.4	12.04 +.05	45 4 2.6	11.58 .00	46.5 2.6	32.33 .05	38.0 1.5	78.54 .57	57.1 2.9
28.4	12.04 −.05	47.9 2.4	11.55 −.05	49.0 2.4	32.36 +.02	39.5 1.4	77.84 .82	59.9 2.7
July 8.4	11.93 .14	50.3 2.2	11.48 .09	51.3 2.1	32.36 −.02	40 9 1.3	76.89 1.05	62.5 2.4
18.4	11.74 −.24	52.4 −1.9	11 37 −.13	53.3 +1.8	32.32 −.05	42.1 +1.2	75.73−1.26	64.8 +2.0
28.3	11.45 .32	54.2 1.6	11.22 .16	55.0 1.5	32.25 .09	43.2 1.0	74.38 1.43	66.6 1.6
Aug. 7.3	11.09 .39	55.6 1.2	11.04 .19	56.3 1.1	32.14 .12	44.1 0.8	72.86 1.58	68.0 1.2
17.3	10.66 .45	56.6 0.8	10.82 .22	57.2 0.6	32.02 .14	44.7 0.5	71.21 1.69	68.9 0.7
27.2	10.18 .49	57.2 −0.3	10.59 .24	57.6 +0.2	31.86 .16	45.1 0.3	69.48 1.76	69.4 +0.2
Sept. 6.2	9.68 −.50	57.2 +0.2	10.35 −.25	57.6 −0.2	31.70 −.17	45.3 +0.1	67.68−1.80	69.4 −0.3
16.2	9.18 .49	56.8 0.6	10.10 .24	57.1 0.7	31.53 .17	45.3 −0.2	65.88 1.79	68.8 0.8
26.2	8.70 .46	56.0 1.1	9.86 .23	56.2 1.1	31.36 .16	45.0 0.4	64.10 1.74	67.8 1.3
Oct. 6.1	8.26 .40	54.6 1.5	9.64 .21	54.9 1.6	31.20 .14	44.4 0.7	62.40 1.65	66.2 1.8
16.1	7.90 .32	52.9 1.9	9.45 .18	53.1 2.0	31.07 .12	43.5 1.0	60.80 1.52	64.2 2.2
26.1	7.62 −.23	50.9 +2.2	9.29 −.14	50.9 −2.4	30.96 −.08	42.4 −1.2	59.36−1.34	61.8 −2.6
Nov. 5.1	7.44 −.11	48.6 2.4	9.18 .09	48.4 2.7	30.90 −.04	41.1 1.5	58.12 1.13	58.9 3.0
15.0	7.39 + 01	46.2 2.5	9.12 −.03	45.5 3.0	30.88 .00	39.5 1.7	57.11 .88	55.8 3.3
25.0	7.46 .13	43.7 2.5	9.12 +.03	42.3 3.2	30.90 +.05	37.6 1.9	56.36 .60	52.4 3.5
Dec. 5.0	7.66 .26	41.3 2.4	9.17 .09	39.0 3.4	30.96 .10	35.6 2.1	55.90− .39	48.8 3.6
14 9	7.99 +.38	39.0 +2.2	9.29 +.14	35.6 −3.4	31.10 +.15	33.5 −2.2	55.75 .00	45.1 −3.7
24.9	8.43 .49	36.9 1.9	9.46 .19	32.1 3.4	31.27 .19	31.2 2.2	55.91+ .32	41.5 3.6
34.9	8.97 +.59	35.1 +1.6	9.68 +.24	28.8 −3.2	31.48 +.22	29.0 −2.2	56.39+ .62	38.0 −3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d* Herculis.		α^1 Herculis.		*b* Ophiuchi.		*β* Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 16 57	° ′ +33 43	h m 17 9	° ′ +14 30	h m 17 19	° ′ −24 4	h m 17 27	° ′ +52 22
	s	″	s	″	s	″	s	″
(Dec.30.9)	32.73 +.20	28.8 −3.2	38.47 +.20	49.8 −2.4	40.22 +.22	27.5 −0.3	55.69 +.18	48.7 −3.6
Jan. 9.9	32.96 .24	25.6 3.0	38.68 .23	47.4 2.3	40.46 .26	27.9 0.4	55.89 .23	45.1 3.4
19.9	33.22 .26	22.8 2.7	38.93 .25	45.1 2.2	40.74 .29	28.3 0.5	56.15 .29	41.8 3.1
29.8	33.51 .30	20.2 2.3	39.20 .27	43.0 1.9	41.03 .31	28.8 0.5	56.47 .33	38.9 2.7
Feb. 8.8	33.83 .32	18.1 1.9	39.48 .29	41.2 1.6	41.35 .32	29.4 0.5	56.82 .37	36.4 2.2
18.8	34.16 +.33	16.5 −1.3	39.78 +.30	39.8 −1.2	41.68 +.33	29.9 −0.5	57.21 +.40	34.4 −1.6
28.8	34.49 .33	15.5 0.8	40.08 .30	38.7 0.8	42.01 .33	30.5 0.5	57.61 .41	33.1 1.0
Mar. 10.7	34.82 .33	15.0 −0.2	40.38 .30	38.1 −0.4	42.35 .33	31.0 0.5	58.03 .42	32.4 −0.3
20.7	35.14 .32	15.0 +0.4	40.68 .29	37.9 0.0	42.68 .32	31.4 0.4	58.44 .41	32.3 +0.3
30.7	35.45 .30	15.7 0.9	40.97 .28	38.2 +0.4	43.00 .31	31.8 0.3	58.85 .39	33.0 0.9
Apr. 9.6	35.74 +.28	16.9 +1.4	41.24 +.26	38.9 +0.8	43.31 +.30	32.1 −0.3	59.23 +.36	34.2 +1.5
19.6	36.01 .25	18.5 1.8	41.49 .24	39.9 1.2	43.60 .28	32.3 0.2	59.58 .33	35.9 2.0
29.6	36.24 .22	20.5 2.1	41.72 .22	41.2 1.5	43.88 .26	32.5 0.2	59.89 .29	38.2 2.4
May 9.6	36.44 .19	22.8 2.4	41.93 .19	42.8 1.7	44.13 .24	32.7 0.2	60.16 .24	40.8 2.7
19.5	36.61 .15	25.3 2.6	42.11 .17	44.6 1.8	44.35 .21	32.9 0.2	60.38 .19	43.7 3.0
29.5	36.74 +.11	27.9 +2.6	42.26 + 14	46.5 +1.9	44.55 +.18	33.1 −0.2	60.54 +.14	46.8 +3.2
June 8.5	36.83 .07	30.6 2.6	42.38 .10	48.4 1.9	44.71 .14	33.3 0.2	60.65 .08	50.0 3.2
18.5	36.88 +.02	33.2 2.5	42.46 .06	50.3 1.8	44.83 .10	33.5 0.2	60.70 +.02	53.1 3.1
28.4	36 88 −.02	35.7 2.4	42.51 +.02	52.1 1.7	44.92 .06	33.7 0.2	60.69 −.04	56.2 3.0
July 8.4	36.84 .06	38.0 2.1	42.51 −.01	53.8 1.6	44.96 +.02	33.9 0.2	60.62 .10	59.0 2.7
18.4	36.76 −.10	40.0 +1.9	42.48 −.05	55.3 +1.4	44.96 −.02	34.2 −0.2	60.49 −.15	61.6 +2.4
28.3	36.65 .13	41.7 1.6	42.41 .08	56.6 1.2	44.91 .06	34.4 0.2	60.30 .20	63.9 2.1
Aug. 7.3	36.49 .16	43.1 1.2	42.31 .11	57.7 0.9	44.83 .10	34.6 0.2	60.07 .25	65.8 1.7
17.3	36.31 .19	44.2 0.8	42.18 .14	58.5 0.7	44.72 .13	34.8 0.1	59.80 .29	67.4 1.3
27.3	36.10 .21	44.8 +0.4	42.03 .16	59.1 0.4	44.57 .15	34.9 −0.1	59.49 .32	68.4 0.8
Sept. 6.2	35.88 −.22	45.0 0.0	41.86 −.17	59.4 +0.1	44.41 −.17	35.0 0.0	59.16 −.34	69.0 +0.3
16.2	35.66 .23	44.8 −0.4	41.68 .18	59.4 −0.2	44.23 .18	34.9 +0.1	58.81 .35	69.0 −0.2
26.2	35.43 .22	44.2 0.8	41.50 .17	59.0 0.5	44.05 .17	34.8 0.1	58.46 .34	68.6 0.7
Oct. 6.2	35.22 .20	43.1 1.2	41.33 .16	58.4 0.7	43.89 .16	34.7 0.2	58.12 .33	67.6 1.2
16.1	35.03 .17	41.6 1.7	41.18 .14	57.5 1.0	43.74 .13	34.5 0.2	57.81 .30	66.2 1.7
26.1	34.88 −.13	39.7 −2.1	41.06 −.11	56.3 −1.3	43.63 −.09	34.3 +0.2	57.52 −.26	64.3 −2.1
Nov. 5.1	34.76 .09	37.4 2.4	40.98 .06	54.8 1.6	43.55 −.05	34.0 0.2	57.29 .21	61 9 2.6
15.0	34.76 −.04	34.9 2.7	40.93 −.02	53.1 1.9	43.52 .00	33.8 0.2	57.11 .15	59.1 3.0
25.0	34.68 +.01	32.0 3.0	40.94 +.03	51.1 2.1	43.54 +.05	33.7 +0.1	56.99 .08	56.0 3.3
Dec. 5.0	34.73 .07	28.9 3.2	40.99 .06	48.8 2.3	43.62 .10	33.6 0.0	56.94 −.01	52.6 3.5
15.0	34.83 +.12	25.7 −3.2	41.10 +.13	46.5 −2.4	43.75 +.15	33.7 −0.1	56.96 +.06	49.0 −3.6
24.9	34.98 .17	22.4 3.2	41.25 .17	44.1 2.4	43.93 .20	33.9 0.2	57.05 .13	45 3 3.6
34.9	35.18 +.22	19.3 −3.1	41.44 +.21	41.6 −2.4	44.15 +.24	34.2 −0.3	57.22 +.20	41.7 −3.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ophiuchi.		ω Draconis.		μ Herculis.		ψ¹ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$17^{h}\ 29^{m}$	$+12^{\circ}\ 38'$	$17^{h}\ 37^{m}$	$+68^{\circ}\ 48'$	$17^{h}\ 42^{m}$	$+27^{\circ}\ 46'$	$17^{h}\ 43^{m}$	$+72^{\circ}\ 11'$
	s	″	s	″	s	″	s	″
Jan. 0.0	50.27 +.18	19.1 −2.3	31.96 +.17	22.7 −3.7	9.34 +.16	59.5 −3.0	48.64 +.15	60.9 −3.7
9.9	50.46 .21	16.8 2.2	32.18 .27	19.1 3.5	9.52 .19	56.5 2.9	48.86 .28	57.2 3.5
19.9	50.69 .24	14.6 2.1	32.51 .37	15.7 3.2	9.73 .23	53.7 2.7	49.21 .41	53.8 3.3
29.9	50.95 .26	12.5 1.9	32.94 .46	12.6 2.8	9.98 .26	51.2 2.4	49.67 .52	50.7 2.9
Feb. 8.8	51.22 .28	10.8 1.6	33.44 .54	10.0 2.3	10.26 .28	49.0 2.0	50.24 .61	48.1 2.4
18.8	51.51 +.29	9.3 −1.2	34.02 +.59	8.0 −1.7	10.55 +.30	47.2 −1.5	50.89 +.68	46.0 −1.8
28.8	51.81 .30	8.3 0.8	34.63 .63	6.6 1.1	10.86 .31	45.9 1.0	51.60 .72	44.4 1.2
Mar. 10.8	52.11 .30	7.6 −0.4	35.28 .64	5.8 −0.4	11.17 .31	45.1 −0.5	52.34 .75	43.6 −0.5
20.7	52.40 .29	7.4 0.0	35.92 .64	5.7 +0.2	11.48 .31	44.8 0.0	53.09 .74	43.4 +0.1
30.7	52.69 .28	7.6 +0.4	36.55 .61	6.3 0.8	11.79 .30	45.1 +0.5	53.83 .72	43.9 0.8
Apr. 9.7	52.97 +.27	8.2 +0.8	37.15 +.57	7.5 +1.5	12.09 +.29	45.9 +1.0	54.52 +.67	45.0 +1.4
19.7	53.24 .25	9.1 1.1	37.69 .51	9.3 2.0	12.37 .27	47.2 1.5	55.16 .60	46.7 2.0
29.6	53.48 .23	10.4 1.4	38.17 .44	11.6 2.5	12.63 .25	48.9 1.9	55.72 .51	48.9 2.4
May 9.6	53.71 .21	11.9 1.6	38.57 .35	14.2 2.8	12.67 .22	50.9 2.2	56.19 .41	51.6 2.8
19.6	53.91 .18	13.6 1.8	38.88 .26	17.2 3.1	13.08 .19	53.2 2.4	56.55 .30	54.5 3.0
29.5	54.08 +.15	15.4 +1.9	39.09 +.16	20.4 +3.2	13.25 +.16	55.6 +2.5	56.80 +.19	57.6 +3.2
June 8.5	54.22 .12	17.3 1.9	39.21 +.06	23.7 3.3	13.39 .12	58.1 2.5	56.93 +.07	60.9 3.3
18.5	54.32 .08	19.2 1.8	39.22 −.04	27.0 3.2	13.49 .08	60.6 2.5	56.94 −.05	64.2 3.2
28.5	54.38 +.04	21.0 1.7	39.12 .14	30.2 3.1	13.55 +.03	63.1 2.4	56.82 .18	67.4 3.1
July 8.4	54.41 .00	22.6 1.6	38.93 .24	33.2 2.9	13.57 −.01	65.4 2.2	56.59 .29	70.4 2.9
18.4	54.39 −.03	24.2 +1.4	38.64 −.33	36.0 +2.6	13.54 −.05	67.6 +2.0	56.24 −.40	73.2 +2.6
28.4	54.34 .07	25.5 1.2	38.27 .42	38.5 2.3	13.47 .09	69.5 1.8	55.79 .50	75.7 2.3
Aug. 7.4	54.25 .10	26.6 1.0	37.81 .49	40.6 1.8	13.36 .13	71.1 1.5	55.24 .58	77.8 1.9
17.3	54.13 .13	27.5 0.7	37.29 .55	42.2 1.4	13.22 .16	72.4 1.1	54.62 .66	79.5 1.5
27.3	53.99 .15	28.2 0.5	36.72 .60	43.4 0.9	13.04 .19	73.4 0.8	53.92 .73	80.8 1.0
Sept. 6.3	53.82 −.17	28.5 +0.2	36.10 −.63	44.1 +0.4	12.85 −.20	74.0 +0.4	53.19 −.75	81.6 +0.5
16.2	53.65 .18	28.6 −0.1	35.46 .64	44.3 −0.1	12.64 .21	74.1 0.0	52.42 .77	81.8 0.0
26.2	53.47 .17	28.4 0.3	34.81 .64	43.9 0.6	12.42 .21	74.0 −0.4	51.64 .77	81.6 −0.5
Oct. 6.2	53.30 .16	27.9 0.6	34.18 .62	43.0 1.1	12.21 .20	73.4 0.8	50.87 .75	80.8 1.1
16.2	53.14 .14	27.2 0.9	33.58 .58	41.6 1.6	12.02 .18	72.4 1.2	50.13 .71	79.4 1.6
26.1	53.01 −.11	26.1 −1.2	33.02 −.52	39.8 −2.1	11.85 −.15	71.0 −1.6	49.45 −.65	77.6 −2.1
Nov. 5.1	52.91 .08	24.8 1.5	32.53 .45	37.4 2.6	11.72 .11	69.2 1.9	48.84 .56	75.3 2.5
15.1	52.86 −.03	23.2 1.7	32.13 .36	34.6 3.0	11.62 .07	67.1 2.3	48.32 .46	72.6 2.9
25.1	52.85 +.01	21.3 1.9	31.82 .26	31.4 3.3	11.57 −.02	64.7 2.5	47.92 .34	69.5 3.2
Dec. 5.0	52.88 .06	19.3 2.1	31.61 .15	28.0 3.5	11.58 +.03	62.0 2.8	47.64 .21	66.1 3.5
15.0	52.97 +.11	17.1 −2.2	31.52 −.03	24.3 −3.7	11.63 +.08	59.2 −2.9	47.49 −.08	62.5 −3.7
25.0	53.10 .15	14.8 2.3	31.56 +.09	20.6 3.7	11.73 .13	56.2 3.0	47.48 +.06	58.7 3.7
34.9	53.27 +.19	12.5 −2.3	31.70 +.21	16.9 −3.6	11.88 +.17	53.3 −3.0	47.61 +.20	55.0 −3.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Draconis.		γ^2 Sagittarii.		μ Sagittarii.		η Serpentis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *South*.
	h m 17 54	+51° 29′	h m 17 58	−30° 25′	h m 18 7	−21° 5′	h m 18 15	− 2° 55′
	s	″	s	″	s	″	s	″
Jan. 0.0	1.92 +.13	60.5 −3.6	45.56 +.20	31.1 +0.3	12.10 +.17	15.1 −0.3	37.82 +.15	38.9 −1.3
9.9	2.08 .19	57.0 3.5	45.77 .23	30.9 0.2	12.29 .21	15.4 0.3	37.99 .18	40.3 1.4
19.9	2.30 .25	53.6 3.2	46.03 .27	30.7 +0.1	12.52 .24	15.7 0.3	38.18 .21	41.6 1.3
29.9	2.58 .30	50.5 2.9	46.31 .30	30.6 0.0	12.78 .27	16.0 0.3	38.41 .24	42.9 1.2
Feb. 8.9	2.90 .34	47.8 2.4	46.62 .32	30.6 0.0	13.06 .29	16.4 0.3	38.66 .26	44.0 1.0
18.8	3.26 +.37	45.7 −1.9	46.95 +.33	30.7 0.0	13.36 +.30	16.7 −0.3	38.92 +.28	45.0 −0.8
28.8	3.64 .39	44.1 1.3	47.29 .34	30.7 −0.1	13.67 .31	16.9 0.2	39.21 .29	45.7 0.6
Mar. 10.8	4.04 .40	43.1 −0.6	47.64 .35	30.8 0.1	13.99 .32	17.1 −0.1	39.50 .29	46.1 −0.3
20.8	4.45 .40	42.8 0.0	47.98 .35	30.9 0.1	14.31 .32	17.1 0.0	39.79 .30	46.3 0.0
30.7	4.85 .39	43.2 +0.6	48.33 .34	31.0 0.1	14.63 .32	17.1 +0.1	40.09 .29	46.2 +0.2
Apr. 9.7	5.24 +.37	44.1 +1.2	48.68 +.33	31.1 −0.1	14.95 +.31	17.0 +0.1	40.38 +.29	45.9 +0.5
19.7	5.61 .35	45.6 1.8	49.01 .32	31.3 0.1	15.26 .30	16.8 0.2	40.67 .28	45.2 0.7
29.6	5.94 .32	47.7 2.3	49.32 .31	31.4 0.2	15.56 .29	16.6 0.2	40.95 .27	44.4 0.9
May 9.6	6.24 .27	50.2 2.6	49.62 .29	31.6 0.2	15.84 .27	16.4 0.3	41.21 .25	43.4 1.0
19.6	6.48 .22	53.0 2.9	49.89 .26	31.9 0.3	16.10 .25	16.1 0.2	41.45 .23	42.4 1.1
29.6	6.68 +.17	56.0 +3.1	50.14 +.23	32.2 −0.4	16.34 +.22	15.9 +0.2	41.66 +.20	41.2 +1.2
June 8.5	6.83 .12	59.2 3.2	50.35 .19	32.6 0.4	16.54 .19	15.7 0.2	41.85 .17	40.0 1.2
18.5	6.92 +.06	62.4 3.2	50.52 .15	33.0 0.5	16.71 .15	15.5 +0.1	42.01 .14	38.8 1.2
28.5	6.94 .00	65.5 3.1	50.65 .10	33.5 0.5	16.83 .11	15.5 0.0	42.13 .10	37.6 1.1
July 8 4	6.91 −.06	68.6 2.9	50.73 .06	34.1 0.6	16.92 .06	15.5 0.0	42.21 .06	36.6 1.0
18.4	6.82 −.12	71.4 +2.7	50.77 +.01	34.7 −0.6	16.96 +.02	15.5 −0.1	42.25 +.02	35.7 +0.9
28.4	6.67 .17	73.9 2.4	50.76 −.03	35.3 0.6	16.96 −.02	15.6 0.1	42.24 −.02	34.9 0.7
Aug. 7.4	6.47 .22	76.1 2.0	50.70 .08	35.8 0.5	16.91 .06	15.8 0.2	42.20 .06	34.2 0.6
17.3	6.22 .26	77.9 1.6	50.60 .12	36.4 0.5	16.83 .10	16.0 0.2	42.12 .10	33.7 0.4
27.3	5.94 .30	79.2 1.1	50.46 .15	36.8 0.4	16.71 .13	16.2 0.2	42.00 .13	33.3 0.3
Sept. 6.3	5.62 −.33	80.2 +0.7	50.30 −.17	37.1 −0.3	16.56 −.15	16.3 −0.2	41.86 −.15	33.0 +0.1
16.3	5.28 .34	80.6 +0.2	50.12 .18	37.4 −0.2	16.40 .17	16.4 0.1	41.70 .16	33.0 0.0
26.2	4.94 .34	80.5 −0.3	49.93 .19	37.4 0.0	16.22 .17	16.6 −0.1	41.54 .17	33.0 −0.1
Oct. 6.2	4.60 .33	79.9 0.9	49.74 .18	37.4 +0.1	16.05 .16	16.6 0.0	41.37 .16	33.2 0.3
16.2	4.28 .31	78.8 1.4	49.57 .16	37.2 0.2	15.88 .15	16.6 0.0	41.21 .15	33.6 0.4
26.1	3.98 −.28	77.2 −1.8	49.42 −.13	36.9 +0.3	15.74 −.12	16.6 0.0	41.07 −.12	34.0 −0.6
Nov. 5.1	3.72 .23	75.1 2.3	49.31 .09	36.5 0.4	15.64 .08	16.6 0.0	40.96 .09	34.7 0.7
15.1	3.52 .18	72.6 2.7	49.24 −.04	36.1 0.5	15.57 −.04	16.6 0.0	40.88 .06	35.5 0.9
25.1	3.37 .12	69.7 3.1	49.23 +.01	35.6 0.5	15.55 .00	16.6 0.0	40.85 −.01	36.4 1.0
Dec. 5.0	3.29 −.05	66.5 3.3	49.26 .06	35.2 0.4	15.58 +.05	16.7 −0.1	40.86 +.03	37.5 1.1
15.0	3.27 +.02	63.0 −3.5	49.36 +.12	34.7 +0.4	15.66 +.10	16.8 −0.2	40.91 +.08	38.7 −1.2
25.0	3.32 .09	59.5 3.6	49.50 .17	34.4 0.3	15.78 .15	17.0 0.2	41.01 .12	40.0 1.3
35.0	3.44 +.15	55.9 −3.6	49.69 +.21	34.1 +0.2	15.95 +.19	17.3 −0.3	41.15 +.16	41.4 −1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Aquilæ.		α Lyræ. (*Vega*.)		σ Octantis.		β Lyræ.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.
	h m 18 29	° ′ − 8 19	h m 18 33	° ′ +38 40	h 18	° ′ −89 15	h m 18 46	° ′ +33 13
	s	″	s	″	m s s	″	s	″
Jan. 0.0	14.13 +.14	15.9 −1.0	12.50 +.09	52.1 −3.2	41 51.4+ 4.2	61 4 +3.4	1.00 +.08	66.4 −3.0
10.0	14.28 .17	16.9 1.0	12.61 .13	48.9 3.2	41 57.3 7.4	58.1 3.2	1.11 .12	63.4 3.0
19.9	14.47 .20	17.9 0.9	12.77 .18	45.8 3.1	42 6.2 10.4	55.0 3.0	1.25 .16	60.4 2.9
29.9	14.69 .23	18.8 0.8	12.98 .22	42.8 2.8	42 18.0 13.0	52.1 2.7	1.44 .20	57.6 2.7
Feb. 8.9	14.94 .26	19.6 0.7	13.22 .26	40.2 2.4	42 32.2 15.3	49.5 2.4	1.67 .24	55.1 2.4
18.9	15.20 +.28	20.3 −0.6	13.50 +.29	38.0 −2.0	42 48.4+17.1	47.3 +2.0	1.92 +.27	53.0 −2.0
28.8	15.49 .29	20.8 0.4	13.80 .31	36.2 1.5	43 6.3 18.5	45.5 1.6	2.20 .29	51.2 1.5
Mar. 10.8	15.78 .30	21.1 −0.2	14.12 .33	35.1 0.9	43 25.4 19.6	44.1 1.1	2.50 .31	50.1 0.9
20.8	16.08 .30	21.2 0.0	14.46 .34	34.5 −0.3	43 45.3 20.1	43.2 0.6	2.82 .32	49.4 −0.3
30.7	16.38 .30	21.0 +0.3	14.80 .34	34.5 +0.3	44 5.5 20.2	42.8 +0.1	3.14 .32	49.4 +0.2
Apr. 9.7	16.68 +.30	20.7 +0.5	15.14 +.33	35.1 +0.9	44 25.7+20.0	43.0 −0.3	3.47 +.32	49.9 +0.8
19 7	16.98 .29	20.1 0.6	15.47 .32	36.2 1.4	44 45.4 19.3	43.5 0.8	3.78 .31	50.9 1.3
29.7	17.26 .28	19.4 0.8	15.78 .30	37.9 1.9	45 4.2 18.2	44.6 1.3	4.09 .30	52.4 1.7
May 9.6	17.54 .26	18.5 0.9	16.08 .28	40.0 2.2	45 21.8 16.8	46.1 1.7	4.38 .28	54.4 2.1
19.6	17.80 .24	17.6 1.0	16.34 .26	42.4 2.6	45 37.7 15.0	48.0 2.1	4.65 .26	56.6 2.4
29.6	18.03 +.22	16.6 +1.0	16.57 +.21	45.1 +2.8	45 51.8+12.9	50.2 −2.4	4.88 +.22	59.2 +2.6
June 8.6	18.21 .19	15.6 0.9	16.76 .17	48.0 2.9	46 3.5 10.5	52.8 2.7	5.09 .18	62.0 2.8
18.5	18.41 .16	14.7 0.9	16.91 .12	51.0 3.0	46 12.7 7.9	55.6 2.9	5.25 .14	64.8 2.9
28.5	18.55 .12	13.8 0.8	17.01 .07	54.0 2.9	46 19.2 5.0	58.6 3.0	5.37 .09	67.7 2.8
July 8.5	18.64 .06	13.0 0.7	17.06 +.02	57.0 2.8	46 22.7+ 2.0	61.7 3.1	5.44 +.05	70.5 2.7
18.4	18.70 +.03	12.3 +0.6	17.06 −.03	59.8 +2.7	46 23.3− 1.0	64.8 −3.1	5.46 .00	73.2 +2.6
28.4	18.71 −.01	11.8 0.5	17.01 .07	62.4 2.5	46 20.8 4.0	67.8 3.0	5.44 −.05	75.7 2.4
Aug. 7.4	18.68 .05	11.3 0.4	16.91 .12	64.7 2.2	46 15.3 6.8	70.7 2.7	5.37 .09	77.9 2.1
17.4	18.61 .09	11.0 0.3	16.76 .16	66.7 1.8	46 7.2 9.5	73.3 2.4	5.25 .13	79.9 1.8
27.3	18.51 .12	10.8 0.2	16.58 .20	68.3 1.4	45 56.5 11.8	75.6 2.0	5.10 .17	81.5 1.4
Sept. 6.3	18.37 −.14	10.6 +0.1	16.37 −.23	69.6 +1.0	45 43.7−13.7	77.4 −1.5	4.92 −.20	82.8 +1.0
16.3	18.22 .16	10.6 0.0	16.13 .25	70.4 0.6	45 29.2 15.1	78.7 1.0	4.70 .22	83.6 0.6
26.3	18.06 .17	10.7 −0.1	15.88 .26	70.8 +0.1	45 13.7 15.9	79.4 −0.5	4.48 .23	84.1 +0.2
Oct. 6.2	17.89 .16	10.9 0.2	15.62 .25	70.7 −0.3	44 57.6 16.1	79.6 +0.1	4.25 .23	84.1 −0.2
16.2	17.73 .15	11.1 0.3	15.37 .24	70.1 0.8	44 41.7 15.6	79.1 0.7	4.02 .22	83.7 0.6
26.2	17.59 −.13	11.5 −0.4	15.14 −.22	69.1 −1.2	44 26.6−14.4	78.1 +1.3	3.81 −.20	82.8 −1.1
Nov. 5.1	17.47 .10	11.9 0.5	14.94 .19	67.6 1.7	44 13.0 12.7	76.4 1.9	3.62 .17	81.5 1.5
15.1	17.39 06	12.5 0.6	14.77 .15	65.7 2.1	44 1.4 10.4	74.3 2.4	3.46 .14	79.8 1.9
25.1	17.35 −.02	13.1 0.7	14.64 .10	63.4 2.5	43 52.3 7.6	71.7 2.8	3.34 .09	77.8 2.2
Dec. 5.1	17.35 +.02	13.9 0.8	14.56 −.05	60.8 2.8	43 46.2 4.5	68.8 3.1	3.27 −.05	75.3 2.5
15.0	17.40 +.07	14.8 −0.9	14.54 .00	57.9 −3.0	43 43.2− 1.3	65.6 +3.2	3.24 .00	72.7 −2.8
25.0	17.49 .11	15.7 0.9	14.57 +.05	54.8 3.1	43 43.6+ 2.1	62.3 3.3	3.27 +.05	69.8 2.9
35.0	17.62 +.15	16.6 −1.0	14.65 +.11	51.6 −3.2	43 47.4+ 5.4	58.9 +3.4	3.34 +.10	66.8 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		ζ Aquilæ.		d Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 18 48	° ′ -26 25	h m 18 49	° ′ +75 17	h m 19 0	° ′ +13 41	h m 19 11	° ′ -19 8
	s	″	s	″	s	″	s	″
Jan. 0.0	27.71 +.14	58.8 +0.2	48.28 -.10	75.7 -3.5	21.75 +.08	61.8 -2.1	12.92 +.10	53.2 -0.2
10.0	27.86 .18	58.5 0.2	48.26 +.07	72.1 3.5	21.85 .12	59.6 2.1	13.04 .14	53.4 0.2
20.0	28.06 .21	58.3 0.2	48.41 .23	68.6 3.5	21.99 .16	57.5 2.0	13.20 .18	53.5 0.1
29.9	28.29 .24	58.1 0.2	48.72 .38	65.2 3.3	22.17 .19	55.6 1.9	13.40 .21	53.6 -0.1
Feb. 8.9	28.55 .27	57.9 0.2	49.18 .52	62.0 2.9	22.38 .22	53.6 1.6	13.62 .24	53.7 0.0
18.9	28.83 +.29	57.7 +0.2	49.77 +.65	59.3 -2.5	22.61 +.24	52.3 -1.3	13.87 +.26	53.7 +0.1
28.8	29.14 .31	57.5 0.3	50.47 .75	57.1 1.9	22.86 .26	51.1 1.0	14.14 .28	53.6 0.2
Mar. 10.8	29.45 .32	57.2 0.3	51.26 .83	55.5 1.3	23.13 .28	50.3 0.6	14.43 .30	53.3 0.3
20.8	29.78 .33	56.9 0.3	52.10 .86	54.4 -0.7	23.42 .29	49.9 -0.2	14.74 .31	53.0 0.4
30.8	30.12 .34	56.6 0.4	52.98 .87	54.1 0.0	23.71 .30	50.0 +0.2	15.05 .32	52.5 0.5
Apr. 9.7	30.45 +.34	56.2 +0.4	53.85 +.86	54.4 +0.6	24.01 +.30	50.4 +0.7	15.37 +.32	52.0 +0.6
19.7	30.79 .33	55.8 0.4	54.70 .82	55.3 1.2	24.30 .29	51.3 1.1	15.69 .32	51.3 0.7
29.7	31.12 .32	55.4 0.4	55.49 .75	56.9 1.8	24.59 .28	52.5 1.4	16.01 .31	50.6 0.7
May 9.7	31.43 .31	55.0 0.3	56.19 .66	58.9 2 2	24.87 .27	54.0 1.7	16.32 .30	49.9 0.7
19.6	31.73 .29	54.8 0.3	56.80 .54	61.4 2 7	25.14 .25	55.8 1.9	16.61 .29	49.1 0.7
29.6	32.01 +.26	54.5 +0.2	57.28 +.42	64.3 +3.0	25.38 +.23	57.8 +2.0	16.89 +.27	48.4 +0.7
June 8.6	32.26 .23	54.4 +0.1	57.64 .28	67.4 3.2	25.59 .20	59.9 2.1	17.15 .24	47.8 0.6
18.5	32.47 .20	54.4 0.0	57.85 +.14	70.7 3.3	25.78 .17	62.0 2.1	17.37 .20	47.3 0.5
28.5	32.65 .15	54.5 -0.1	57.92 -.01	74.1 3.4	25.92 .13	64.2 2.1	17.56 .16	46.8 0.4
July 8.5	32.78 .11	54.7 0.2	57.83 .16	77.4 3.3	26.03 .08	66.2 2.0	17.70 .12	46.5 0.3
18.5	32.86 +.06	55.0 -0.3	57.60 -.30	80 7 +3.2	26.09 +.04	68.2 +1.9	17.80 +.08	46.3 +0.1
28.4	32.90 +.01	55.4 0.4	57.23 .44	83.8 2.9	26.12 .00	70.0 1.7	17.86 +.03	46.3 0.0
Aug. 7.4	32.89 -.03	55.8 0.5	56.73 .56	86.7 2.7	26.09 -.04	71.6 1.5	17.87 -.01	46.3 -0.1
17.4	32.83 .07	56.3 0.5	56.11 .67	89.2 2.4	26.03 .08	72.9 1.2	17.83 .05	46.5 0.2
27.4	32.73 .11	56.8 0.5	55.38 .77	91.4 2.0	25.93 .12	74.0 1.0	17.75 .09	46.7 0.2
Sept. 6.3	32.60 -.14	57.2 -0.4	54.56 -.85	93.1 +1.5	25.79 -.15	74.9 +0.7	17.64 -.12	47.0 -0.3
16.3	32.44 .17	57.6 0.3	53.68 .91	94.5 1.0	25.64 .17	75.5 0.4	17.50 .15	47.2 0.3
26.3	32.27 .18	58.0 0.3	52.74 .94	95.2 +0.5	25.46 .18	75.8 +0.1	17.34 .16	47.5 0.3
Oct. 6.2	32.09 .18	58.2 0.2	51.79 .95	95.6 0.0	25.28 .18	75.8 -0.2	17.17 .17	47.8 0.3
16.2	31.91 .17	58.3 -0.1	50.84 .94	95.3 -0.5	25.10 .17	75.5 0.4	17.00 .16	48.1 0.2
26.2	31.75 -.15	58.4 0.0	49.91 -.90	94.6 -1.0	24.94 -.16	74.9 -0.7	16.84 -.15	48.3 -0.2
Nov. 5.2	31.61 .12	58.3 +0.1	49.03 .84	93.2 1.5	24.79 .13	74.0 1.0	16.71 .12	48.5 0.2
15.1	31.52 .08	58.2 0.2	48.23 .75	91.4 2.0	24.67 .10	72.8 1.3	16.60 .09	48.7 0.2
25.1	31.46 -.03	58.0 0.2	47.52 .64	89.1 2.5	24.59 .06	71.4 1.5	16.53 -.05	48.8 0.1
Dec. 5.1	31.44 +.01	57.7 0.2	46.94 .51	86.4 2.9	24.55 -.02	69.7 1.7	16.50 .00	49.0 0.1
15.1	31.48 +.06	57.5 +0.2	46.50 -.36	83.3 -3.2	24.55 +.02	67.8 -1.9	16.52 +.04	49.1 -0.1
25.0	31.57 .11	57.2 0.2	46.22 .20	79.9 3.4	24.59 .06	65.8 2.0	16.58 .08	49.3 0.2
35.0	31.70 +.15	57.0 +0.2	46.09 -.04	76.4 -3.6	24.67 +.10	63.7 -2.1	16.68 +.12	49.4 -0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.		τ Draconis.		δ Aquilæ.		κ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	$19^{h}\ 12^{m}$	$+67^{\circ}\ 27'$	$19^{h}\ 17^{m}$	$+73^{\circ}\ 8'$	$19^{h}\ 19^{m}$	$+\ 2^{\circ}\ 58'$	$19^{h}\ 30^{m}$	$-\ 7^{\circ}\ 16'$
	s	″	s	″	s	″	s	″
Jan. 0.0	28.14 −.06	69.6 −3.5	34.47 −.16	69.5 −3.5	57.86 +.08	46.8 −1.4	59.28 +.07	16.0 −0.8
10.0	28 12 +.03	66.0 3.6	34.37 −.02	65.9 3.5	57.95 .11	45.3 1.5	59.38 .11	16.9 0.8
20.0	28.20 .13	62.4 3.5	34.42 +.12	62.4 3.5	58.09 .15	43.8 1.4	59.50 .14	17.7 0.8
29.9	28.39 .23	58.9 3.3	34.62 .26	58.9 3.4	58.25 .18	42.5 1.3	59.67 .18	18.4 0.7
Feb. 8.9	28.68 .33	55.7 3.0	34.95 .30	55.6 3.1	58.45 .21	41.3 1.1	59.86 .21	19.1 0.6
18.9	29.06 +.42	52.8 −2.6	35.40 +.51	52.7 −2.7	58.67 +.23	40.2 −0.9	60.08 +.23	19.5 −0.4
28.9	29.51 .49	50.4 2.1	35.96 .60	50.2 2.2	58.91 .25	39.5 0.6	60.32 .25	19.8 −0.2
Mar. 10.8	30.03 .54	48.6 1.5	36.61 .66	48.3 1.6	59.17 .27	39.0 −0.3	60.58 .27	19.9 0.0
20.8	30.59 .58	47.3 0.9	37.33 .73	47.0 1.0	59.45 .28	38.9 0.0	60.86 .28	19.7 +0.3
30.8	31.19 .60	46.7 −0.2	38.08 .76	46.3 −0.3	59.73 .29	39.1 +0.3	61.15 .29	19.4 0.5
Apr. 9.7	31.79 +.60	46.8 +0.4	38.86 +.77	46.2 +0.3	60.03 +.30	39.6 +0.7	61.45 +.30	18.7 +0.7
19.7	32.39 .58	47.5 1.0	39.62 .75	46.8 0.9	60.33 .30	40.4 1.0	61.75 .30	17.9 0.9
29.7	32.96 .55	48.9 1.6	40.36 .70	48.1 1.5	60.62 .29	41.5 1.2	62.06 .30	16.9 1.1
May 9.7	33.49 .50	50.8 2.1	41.03 .64	49.9 2.0	60.91 .28	42.8 1.4	62.36 .29	15.8 1.2
19.6	33.97 .44	53.1 2.5	41.64 .55	52.2 2.5	61.19 .27	44.3 1.6	62.65 .28	14.6 1.3
29.6	34.37 +.36	55.9 +2.9	42 14 +.45	54.8 +2.8	61.45 +.25	45.9 +1.7	62.92 +.26	13.3 +1.3
June 8.6	34.70 .26	59.0 3.2	42.55 .34	57.9 3.1	61.69 .22	47.6 1.7	63.17 .24	12.0 1.3
18.6	34.94 .19	62.3 3.3	42.83 .22	61.1 3.3	61.89 .19	49.3 1.7	63.40 .21	10.8 1.2
28.5	35.08 +.09	65.7 3.4	42.99 +.09	64.5 3.4	62.06 .15	51.0 1.6	63.59 .17	9.6 1.1
July 8.5	35.12 −.01	69.2 3.4	43.02 −.03	68.0 3.4	62.20 .11	52.6 1.5	63.74 .13	8.5 1.0
18.5	35.06 −.11	72.6 +3.3	42.92 −.16	71.4 +3.3	62.29 +.07	54.0 +1.4	63.85 +.09	7.6 +0.9
28.4	34.91 .20	75.9 3.1	42.69 .29	74.7 3.2	62.34 +.03	55.4 1.2	63.92 +.04	6.8 0.7
Aug. 7.4	34.66 .29	78.9 2.9	42.34 .41	77.8 3.0	62.34 −.02	56.5 1.0	63.94 .00	6.2 0.5
17.4	34.32 .37	81.7 2.6	41.88 .51	80.6 2.7	62.31 .06	57.5 0.8	63.92 −.04	5.7 0.4
27.4	33.91 .44	84.1 2.2	41.32 .61	83.2 2.3	62.23 .09	58.2 0.7	63.85 .08	5.4 0.3
Sept. 6.3	33.43 −.51	86.2 +1.6	40.66 −.69	85.3 +1.9	62.12 −.12	58.8 +0.5	63.75 −.11	5.2 +0.1
16.3	32.89 .55	87.8 1.4	39.94 .75	87.0 1.5	61.99 .14	59.2 0.3	63.63 .14	5.2 0.0
26.3	32.32 .58	88.9 1.0	39.16 .79	88.3 1.0	61.83 .16	59.3 +0.1	63.48 .15	5.2 −0.1
Oct. 6.3	31.72 .60	89 5 +0.4	38.35 .82	89.0 +0.5	61.67 .17	59.3 −0.1	63.32 .16	5.4 0.2
16.2	31.12 .60	89.6 −0.2	37.52 .83	89.2 0.0	61.50 .16	59.0 0.3	63.16 .16	5.6 0.3
26.2	30.52 −.58	89.2 −0.7	36.71 −.80	88.9 −0.6	61.34 −.15	58.6 −0.5	63.00 −.15	6.0 −0.4
Nov. 5.2	29.96 .54	88.1 1.3	35.93 .75	88.0 1.1	61.20 .13	58.0 0.7	62.87 .13	6.5 0.5
15.1	29.44 .49	86.6 1.8	35.20 .69	86.6 1.7	61.09 .10	57.2 0.9	62.75 .10	7.0 0.6
25.1	28.98 .42	84.5 2.3	34.54 .61	84.6 2.2	61.01 .06	56.2 1.1	62.67 .07	7.6 0.7
Dec. 5.1	28.60 .34	82.0 2.7	33.99 .50	82.2 2.6	60.96 −.02	55.0 1.2	62.62 −.03	8.3 0.7
15.1	28.30 −.24	79.0 −3.1	33.54 −.39	79.3 −3.0	60.96 +.02	53.8 −1.3	62.62 +.01	9.0 −0.8
25.0	28.11 .14	75.8 3.3	33.22 .25	76.1 3.3	61.00 .06	52.4 1.4	62.65 .05	9.9 0.8
35.0	28.02 −.04	72.3 −3.5	33.04 −.11	72.7 −3.5	61.07 +.10	50.9 −1.5	62.72 +.09	10.7 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Aquilæ.		α Aquilæ. (*Altair.*)		ε Draconis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 41	° ′ +10 20	h m 19 45	° ′ + 8 34	h m 19 48	° ′ +69 59	h m 19 49	° ′ + 6 7
	s	″	s	″	s	″	s	″
Jan. 0.0	2.42 +.05	47.6 −1.8	25.67 +.04	45.4 −1.7	28.37 −.20	25.7 −3.3	55.31 +.05	59.6 −1.5
10.0	2.49 .09	45.7 1.8	25.74 .08	43.7 1.7	28.23 −.08	22.3 3.4	55.37 .08	58.0 1.6
20.0	2.59 .12	43.9 1.7	25.84 .12	42.0 1.6	28.20 +.04	18.8 3.5	55.47 .12	56.5 1.5
30.0	2.73 .15	42.2 1.6	25.98 .15	40.4 1.5	28.30 .15	15.3 3.4	55.61 .15	55.0 1.4
Feb. 8.9	2.90 .18	40.6 1.4	26.15 .18	38.9 1.3	28.51 .27	12.0 3.2	55.77 .18	53.7 1.2
18.9	3.10 +.21	39.3 −1.2	26.35 +.21	37.7 −1.1	28.83 +.37	8.9 −2.9	55.96 +.20	52.5 −1.0
28.9	3.32 .24	38.2 0.9	26.57 .23	36.7 0.8	29.26 .46	6.2 2.5	56.18 .23	51.7 0.7
Mar. 10.9	3.57 .26	37.6 0.5	26.82 .25	36.1 0.5	29.76 .54	3.9 2.0	56.42 .25	51.1 −0.4
20.8	3.84 .27	37.2 −0.2	27.08 .27	35.8 −0.1	30.34 .60	2.3 1.4	56.68 .27	50.9 0.0
30.8	4.12 .28	37.2 +0.2	27.36 .26	35.9 +0.3	30.97 .64	1.2 0.7	56.96 .28	51.0 +0.3
Apr. 9.8	4.41 +.29	37.7 +0.6	27.65 +.29	36.4 +0.6	31.63 +.66	0.8 −0.1	57.25 +.29	51.5 +0.6
19.7	4.71 .30	38.5 1.0	27.95 .30	37.2 1.0	32.29 .66	1.1 +0.6	57.55 .30	52.3 1.0
29.7	5.01 .30	39.7 1.3	28.25 .30	38.4 1.3	32.95 .64	2.0 1.2	57.85 .30	53.4 1.3
May 9.7	5.30 .29	41.1 1.6	28.54 .29	39.8 1.6	33.58 .60	3.4 1.7	58.14 .29	54.8 1.5
19.7	5.59 .28	42.8 1.8	28.83 .28	41.5 1.8	34.15 .54	5.5 2.2	58.43 .28	56.4 1.7
29.6	5.85 +.26	44.7 +1.9	29.10 +.26	43.3 +1.9	34.66 +.47	7.9 +2.6	58.71 +.26	58.1 +1.8
June 8.6	6.10 .23	46.7 2.0	29.36 .24	45.3 2.0	35.09 .38	10.8 3.0	58.96 .24	60.0 1.9
18.6	6.32 .20	48.8 2.1	29.58 .21	47.3 2.0	35.43 .28	14.0 3.3	59.19 .21	61.9 1.9
28.6	6.50 .17	50.9 2.0	29.77 .17	49.3 2.0	35.67 .18	17.4 3.4	59.39 .18	63.8 1.8
July 8.5	6.65 .13	52.9 1.9	29.92 .13	51.3 1.9	35.80 +.07	20.9 3.5	59.54 .14	65.6 1.7
18.5	6.76 +.08	54.8 +1.8	30.04 +.09	53.1 +1.8	35.82 −.05	24.4 +3.5	59.66 +.09	67.3 +1.6
28.5	6.82 +.04	56.6 1.7	30.10 +.04	54.8 1.6	35.72 .15	27.9 3.4	59.73 .05	68.9 1.5
Aug. 7.4	6.84 .00	58.2 1.5	30.13 .00	56.4 1.4	35.52 .25	31.2 3.2	59.76 +.01	70.3 1.3
17.4	6.81 −.05	59.6 1.3	30.11 −.04	57.7 1.2	35.22 .35	34.3 3.0	59.75 −.03	71.5 1.1
27.4	6.74 .09	60.7 1.0	30.04 .08	58.8 1.0	34.83 .44	37.2 2.7	59.69 .07	72.5 0.9
Sept. 6.4	6.64 −.12	61.6 +0.8	29.95 −.11	59.7 +0.8	34.35 −.51	39.7 +2.3	59.60 −.10	73.3 +0.6
16.3	6.51 .14	62.3 0.5	29.82 .14	60.3 0.5	33.80 .57	41.8 1.9	59.46 .13	73.8 0.4
26.3	6.35 .16	62.7 +0.3	29.67 .16	60.7 +0.3	33.20 .62	43.5 1.4	59.33 .15	74.1 +0.2
Oct. 6.3	6.19 .17	62.9 0.0	29.51 .17	60.9 0.0	32.54 .66	44.7 0.9	59.17 .16	74.2 0.0
16.3	6.02 .17	62.8 −0.2	29.34 .16	60.8 −0.2	31.87 .67	45.3 +0.4	59.01 .16	74.0 −0.2
26.2	5.85 −.16	62.4 −0.5	29.18 −.15	60.4 −0.5	31.20 −.66	45.5 −0.1	58.85 −.15	73.7 −0.5
Nov. 5.2	5.70 .14	61.7 0.7	29.03 .14	59.8 0.7	30.54 .64	45.0 0.7	58.70 .14	73.1 0.7
15.2	5.57 .11	60.8 1.0	28.91 .11	59.0 0.9	29.92 .60	44.0 1.3	58.57 .11	72.3 0.9
25.2	5.47 .08	59.7 1.2	28.81 .08	57.9 1.1	29.34 .54	42.5 1.8	58.47 .08	71.3 1.1
Dec. 5.1	5.40 .05	58.4 1.4	28.74 .05	56.7 1.3	28.84 .46	40.4 2.3	58.40 .05	70.1 1.3
15.1	5.37 −.01	56.9 −1.6	28.71 −.02	55.2 −1.5	28.42 −.37	37.9 −2.7	58.37 −.01	68.8 −1.4
25.1	5.38 +.03	55.2 1.7	28.72 +.02	53.7 1.6	28.10 .27	34.9 3.1	58.38 +.03	67.4 1.5
35.0	5.43 +.07	53.4 −1.8	28.76 +.06	52.1 −1.7	27.88 −.16	31.7 −3.3	58.42 +.06	65.8 −1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ.		α² Capricorni.		κ Cephei.		α Pavonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 19 58	° ′ + 6 57	h m 20 11	° ′ −12 52	h m 20 12	° ′ +77 22	h m 20 16	° ′ −57 4
	s	″	s	″	s	″	s	″
Jan. 0.1	46.74 +.04	68.6 −1.5	58.10 +.04	64.7 −0.4	27.59 −.48	61.0 −3.0	58.11 +.02	74.1 +2.1
10 0	46.80 .07	67.0 1.6	58.16 .08	65.1 0.4	27.20 .30	57.8 3.3	58.17 .09	71.9 2.2
20.0	46.89 .11	65.5 1.5	58.25 .11	65.4 0.3	26.99 −.11	54.4 3.4	58.30 .16	69.6 2.3
30.0	47 01 .14	64.0 1.4	58.38 .14	65.7 0.2	26.97 +.07	51.0 3.4	58.49 .22	67.3 2.4
Feb. 9.0	47.17 .17	62 6 1.2	58.54 .17	65.9 −0.1	27.14 .26	47.6 3.3	58.74 .28	64.9 2.3
18.9	47.35 +.20	61.5 −1.0	58.72 +.20	65.9 0.0	27.50 +.44	44.4 −3.0	59.06 +.33	62.6 +2.3
28.9	47.56 .22	60.6 0.7	58.94 .23	65.8 +0.2	28.03 .60	41.5 2.7	59.42 .38	60.4 2.2
Mar. 10.9	47.80 .24	60.0 0.4	59.18 .25	65.4 0.4	28 70 .74	39 0 2.2	59.82 .42	58.3 2.0
20.8	48.05 .26	59.8 −0.1	59.44 .27	64.9 0.6	29.51 .85	37.0 1.7	60.26 .46	56.4 1.8
30.8	48.33 .28	59.9 +0 3	59.72 .29	64.2 0.8	30.41 .97	35.6 1.0	60.74 .49	54.7 1.6
Apr. 9.8	48.61 +.29	60.4 +0 6	60.02 +.30	63.4 +0.9	31.38 +.98	34.9 −0.4	61.24 +.51	53.2 +1.3
19.8	48.91 .30	61.2 1.0	60.32 .31	62.4 1.1	32.37 .99	34.7 +0.2	61.76 .52	52.0 1.0
29.7	49.21 .30	62.3 1.3	60.64 .32	61.2 1.2	33.36 .97	35.2 0.8	62.28 .53	51.2 0.7
May 9.7	49.51 .29	63.7 1.5	60.95 .31	60.0 1.2	34.33 .93	36.3 1.4	62.82 .52	50.6 +0.4
19.7	49.80 .28	65.4 1.7	61.26 .30	58.8 1.3	35.22 .85	38 0 1.9	63.34 .51	50.4 0.0
29.7	50.08 +.27	67.2 +1.8	61.57 +.29	57.5 +1.2	36.02 +.74	40.2 +2.4	63.84 +.49	50.6 −0.3
June 8.6	50.34 .25	69.1 1.9	61.85 .27	56.3 1.2	36.70 .61	42.8 2.8	64.31 .45	51.1 0.7
18.6	50.58 .22	71.1 2.0	62.11 .24	55.1 1.1	37.25 .47	45.8 3.1	64.74 .41	51.9 1.0
28.6	50.78 .18	73.0 1.9	62.34 .21	54.1 1.0	37.65 .31	49.0 3.3	65.12 .35	53.0 1.3
July 8.5	50.94 .14	74.9 1.8	62.53 .17	53.2 0.8	37.88 +.15	52.4 3.4	65.44 .28	54.5 1.6
18.5	51.07 +.10	76.7 +1.7	62.69 +.13	52.4 +0.7	37.95 −.02	56.0 +3.5	65.69 +.21	56.2 −1.8
28.5	51.15 .06	78.4 1.5	62.80 .08	51.9 0.5	37.85 .18	59.5 3.5	65.86 .14	58.0 1.9
Aug. 7.5	51.18 +.01	79.9 1.4	62.86 +.04	51.5 0.3	37.58 .35	62.9 3.4	65.96 +.06	60.1 2.0
17.4	51.18 −.03	81.2 1.2	62.88 −.01	51.2 +0.2	37.15 .50	66.2 3.2	65.98 −.02	62.1 2.0
27.4	51.13 .07	82.2 1.0	62.85 .06	51.1 0.0	36.57 .64	69.3 2.9	65.92 .09	64.2 2.0
Sept. 6.4	51.04 −.10	83.1 +0.7	62.78 −.08	51.2 −0.1	35.86 −.77	72.2 +2.6	65.79 −.16	66.1 −1.9
· 16.4	50.92 .13	83.7 0.5	62.68 .11	51.4 0.2	35.03 .88	74.6 2.3	65.59 .21	67.9 1.6
26.3	50.78 .15	84.1 +0.3	62.55 .14	51.6 0.3	34.10 .97	76.7 1.9	65.35 .26	69.4 1.3
Oct. 6.3	50.62 .16	84.2 0.0	62.40 .15	51.9 0.3	33.10 1.03	78.4 1.4	65.06 .29	70.6 1.0
16.3	50.46 .16	84.1 −0.2	62.25 .16	52.3 0.4	32.04 1.07	79.5 0.9	64.76 .31	71.4 0.6
26 2	50.30 −.15	81.8 −0.4	62.09 −.15	52.7 −0.4	30.95 −1.09	80.1 +0.3	64.45 −.30	71.8 −0.2
Nov. 5.2	50.15 .14	83.3 0.7	61.95 .14	53.1 0.4	29.87 1.06	80.1 −0.2	64.15 .28	71.8 +0.2
15.2	50.02 .12	82.5 0.9	61.82 .12	53.5 0.4	28.81 1.02	79.6 0.8	63.88 .25	71.4 0.6
25.2	49.92 .09	81.6 1.1	61.72 .09	54.0 0.4	27.81 .95	78.5 1.4	63.64 .20	70.5 1.0
Dec. 5.1	49.84 .06	80.4 1.2	61.65 .05	54.4 0.4	26.90 .85	76.8 1 9	63.47 .15	69.3 1.4
15 1	49.80 −.02	79.1 −1.4	61 61 −.02	54.8 −0.4	26.11 −.73	74 7 −2.4	63.35 −.08	67.7 +1.7
25.1	49.80 +.02	77.6 1.5	61.61 +.02	55.2 0.4	25.45 58	72.1 2.8	63.30 −.01	65.9 2.0
35.1	49.83 +.05	76 1 −1.6	61 65 +.05	55.6 −0 4	24.95 −.41	69.1 −3.1	63.32 +.05	63.8 +2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni.		π Capricorni.		ε Delphini.		Groombridge 3241.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 20 18	° ′ +39 54	h m 20 21	° ′ −18 34	h m 20 27	° ′ +10 55	h m 20 30	° ′ +72 9
	s	″	s	″	s	″	s	″
Jan. 0.1	16.74 −.04	27.5 −2.7	2.60 +.04	16.8 −0.1	58.21 .00	54.3 −1.6	24.32 −.35	47.7 −3.0
10.0	16.72 +.01	24.7 2.9	2.65 .07	16.9 0.0	58.23 +.04	52.6 1.7	24.03 .23	44.6 3.2
20.0	16.75 .05	21.7 3.0	2.74 .10	16.8 +0.1	58.29 .07	51.0 1.6	23.86 −.10	41.3 3.4
30.0	16.82 .10	18.8 2.9	2.86 .14	16.7 0.2	58.38 .11	49.3 1.5	23.82 +.03	37.8 3.4
Feb. 9.0	16.95 .14	16.0 2.7	3.02 .17	16.5 0.3	58.51 .14	47.8 1.4	23.92 .16	34.4 3.3
18.9	17.11 +.18	13.4 −2.4	3.20 +.20	16.1 +0.4	58.66 +.17	46.5 −1.2	24.14 +.29	31.2 −3.1
28.9	17.32 .23	11.1 2.0	3.42 .23	15.7 0.5	58.85 .20	45.5 0.9	24.49 .40	28.2 2.8
Mar. 10.9	17.57 .26	9.3 1.6	3.66 .25	15.0 0.7	59.06 .23	44.7 0.6	24.95 .51	25.6 2.3
20.9	17.85 .29	7.9 1.1	3.92 .27	14.3 0.8	59.30 .25	44.3 −0.2	25.51 .59	23.5 1.8
30.8	18.16 .32	7.1 −0.5	4.20 .29	13.4 0.9	59.56 .27	44.3 +0.2	26.15 .66	22.0 1.2
Apr. 9.8	18.49 +.34	6.9 0.0	4.50 +.31	12.4 +1.0	59.84 +.28	44.7 +0.5	26.84 +.71	21.0 −0.6
19.8	18.83 .36	7.2 +0.6	4.82 .32	11.3 1.1	60.13 .29	45.4 0.9	27.57 .73	20.8 0.0
29.7	19.18 .35	8.1 1.1	5.14 .32	10.1 1.2	60.43 .30	46.6 1.3	28.30 .73	21.1 +0.6
May 9.7	19.53 .34	9.5 1.6	5.47 .32	8.9 1.2	60.74 .30	48.0 1.6	29.03 .71	22.1 1.2
19.7	19.87 .33	11.4 2.1	5.79 .32	7.8 1.2	61.04 .30	49.7 1.8	29.72 .66	23.6 1.8
29.7	20.19 +.31	13.7 +2.5	6.11 +.31	6.6 +1.1	61.33 +.28	51.6 +2.0	30.35 +.60	25.7 +2.3
June 8.6	20.48 .28	16.4 2.8	6.40 .29	5.5 1.0	61.61 .26	53.6 2.1	30.91 .51	28.2 2.7
18.6	20.74 .24	19.3 3.0	6.68 .26	4.6 0.9	61.86 .24	55.8 2.2	31.38 .42	31.2 3.1
28.6	20.96 .19	22.3 3.1	6.92 .23	3.8 0.7	62.08 .21	58.0 2.2	31.75 .31	34.4 3.3
July 8.6	21.13 .15	25.5 3.2	7.13 .19	3.2 0.5	62.27 .17	60.1 2.1	32.00 .20	37.8 3.5
18.5	21.25 +.10	28.7 +3.1	7.30 +.14	2.7 +0.3	62.42 +.13	62.2 +2.0	32.14 +.08	41.4 +3.6
28.5	21.32 +.04	31.8 3.0	7.42 .10	2.4 +0.2	62.52 .08	64.2 1.9	32.16 −.04	45.0 3.6
Aug. 7.5	21.34 −.01	34.8 2.9	7.50 +.05	2.4 0.0	62.58 +.04	65.9 1.7	32.05 .16	48.5 3.5
17.4	21.30 .07	37.5 2.7	7.52 .00	2.4 −0.1	62.60 .00	67.5 1.5	31.83 .28	51.9 3.3
27.4	21.21 .11	40.1 2.4	7.50 −.04	2.6 0.3	62.57 −.05	68.9 1.2	31.49 .39	55.2 3.1
Sept. 6.4	21.08 −.15	42.3 +2.0	7.44 −.08	3.0 −0.4	62.50 −.08	70.0 +1.0	31.06 −.48	58.2 +2.8
16.4	20.91 .19	44.2 1.7	7.35 .11	3.4 0.4	62.40 .11	70.9 0.7	30.53 .56	60.8 2.5
26.3	20.70 .22	45.7 1.3	7.22 .13	3.8 0.5	62.28 .14	71.5 0.5	29.93 .64	63.1 2.1
Oct. 6.3	20.47 .23	46.8 0.8	7.08 .15	4.3 0.5	62.13 .15	71.8 +0.2	29.26 .69	64.9 1.6
16.3	20.24 .24	47.4 +0.4	6.92 .16	4.8 0.5	61.97 .16	71.9 0.0	28.55 .72	66 2 1.1
26.2	19.99 −.24	47.5 −0.1	6.76 −.15	5.2 −0.4	61.81 −.16	71.8 −0.3	27.81 −.74	67.0 +0.5
Nov. 5.2	19.75 .23	47.2 0.6	6.61 .14	5.7 0.4	61.65 .15	71.4 0.5	27.07 .73	67.3 0.0
15.2	19.53 .21	46.4 1.0	6.48 .12	6.0 0.3	61.51 .13	70.7 0.8	26.35 .71	67.0 −0.6
25.2	19.34 .18	45.2 1.5	6.37 .09	6.3 0.3	61.39 .11	69.8 1.0	25.65 .66	66.1 1.2
Dec. 5.1	19.17 .15	43.4 1.9	6.29 .06	6.6 0.2	61.30 .08	68.6 1.2	25.02 .60	64.6 1.7
15.1	19.04 −.11	41.4 −2.2	6.25 −.02	6.7 −0.1	61.24 −.05	67.3 −1.4	24.46 −.52	62.6 −2.2
25.1	18.95 .06	38.9 2.5	6.24 +.01	6.8 −0.1	61.21 −.01	65.8 1.5	23.98 .42	60.2 2 6
35.1	18.90 −.02	36.2 −2 8	6.27 +.05	6.9 0.0	61.21 +.02	64.2 −1.6	23.62 −.30	57.3 −3.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	$20^{h}\ 37^{m}$	$+44^{\circ}\ 53'$	$20^{h}\ 46^{m}$	$-\ 9^{\circ}\ 23'$	$20^{h}\ 52^{m}$	$+80^{\circ}\ 8'$	$20^{h}\ 53^{m}$	$+40^{\circ}\ 44'$
	s	″	s	″	s	″	s	″
Jan. 0.1	40.58 −.08	27.8 −2.7	44.32 +.01	40.4 −0.5	24.72− .83	40.5 −2.6	4.28 −.06	52.0 −2.5
10.1	40.52 −.03	25.0 2.9	44.34 .04	41.0 0.5	24.00 .61	37.7 3.0	4.23 −.03	49.3 2.7
20.0	40.52 +.02	22.0 3.0	44.40 .07	41.4 0.4	23.49 .39	34.6 3.2	4.21 +.01	46.5 2.8
30.0	40.56 .07	18.9 3.0	44.49 .10	41.8 0.3	23.22− .15	31.2 3.3	4.24 .05	43.6 2.8
Feb. 9.0	40.66 .12	16.0 2.9	44.61 .13	42.1 −0.2	23.19+ .10	27.9 3.3	4.32 .10	40.8 2.7
19.0	40.81 +.17	13.2 −2.6	44.76 +.16	42.2 0.0	23.41+ .33	24.6 −3.2	4.45 +.15	38.2 −2.5
28.9	41.00 .21	10.7 2.3	44.94 .19	42.1 +0.2	23.86 .56	21.4 3.0	4.62 .19	35.8 2.2
Mar. 10.9	41.24 .26	8.6 1.9	45.15 .22	41.8 0.4	24.53 .76	18.7 2.6	4.83 .23	33.8 1.8
20.9	41.52 .30	7.0 1.4	45.38 .24	41.3 0.6	25.38 .94	16.3 2.1	5.08 .27	32.2 1.3
30.8	41.83 .33	5.9 0.8	45.64 .26	40.6 0.8	26.40 1.08	14.4 1.6	5.37 .30	31.1 0.8
Apr. 9.8	42.17 +.35	5.4 −0.2	45.91 +.28	39.7 +1.0	27.54+1.17	13.1 −1.0	5.68 +.32	30.6 −0.2
19.8	42.53 .37	5.6 +0.4	46.21 .30	38.6 1.2	28.75 1.23	12.5 −0.3	6.02 .34	30.6 +0.3
29.8	42.90 .37	6.2 0.9	46.51 .31	37.3 1.3	30.00 1.24	12.4 +0.3	6.37 .36	31.3 0.9
May 9.7	43.27 .37	7.4 1.5	46.83 .31	35.9 1.4	31.24 1.22	13.0 0.9	6.73 .36	32.4 1.4
19.7	43.64 .36	9.1 2.0	47.14 .31	34.4 1.5	32.44 1.15	14.2 1.4	7.09 .35	34.1 1.8
29.7	43.99 +.33	11.3 +2.4	47.45 +.30	32.9 +1.5	33.54+1.05	15.9 +1.9	7.43 +.33	36.2 +2.3
June 8.6	44.31 .30	13.9 2.7	47.75 .29	31.4 1.5	34.54 .91	18.1 2.4	7.75 .31	38.6 2.6
18.6	44.60 .26	16.8 3.0	48.03 .27	29.9 1.4	35.38 .75	20.8 2.8	8.04 .28	41.4 2.9
28.6	44.84 .22	19.9 3.2	48.28 .24	28.6 1.3	36.04 .57	23.8 3.1	8.30 .24	44.4 3.1
July 8.6	45.04 .17	23.2 3.3	48.50 .20	27.4 1.2	36.52 .38	27.0 3.3	8.51 .19	47.6 3.2
18.5	45.18 +.12	26.5 +3.3	48.68 +.16	26.3 +1.0	36.80+ .17	30.5 +3.5	8.68 +.14	50.8 +3.2
28.5	45.27 +.06	29.8 3.2	48.82 .11	25.4 0.8	36.87− .03	34.0 3.6	8.79 .09	54.0 3.1
Aug. 7.5	45.30 .00	33.0 3.1	48.91 .07	24.7 0.6	36.73 .24	37.6 3.6	8.85 +.03	57.1 3.0
17.5	45.28 −.05	36.0 2.9	48.95 +.02	24.2 0.4	36.38 .44	41.2 3.5	8.85 −.02	60.1 2.9
27.4	45.20 .10	38.8 2.7	48.96 −.02	23.9 0.2	35.84 .63	44.6 3.3	8.80 .07	62.8 2.6
Sept. 6.4	45.07 −.15	41.3 +2.4	48.92 −.06	23.7 +0.1	35.11− .81	47.8 +3.1	8.70 −.12	65.4 +2.3
16.4	44.89 .19	43.5 2.0	48.84 .09	23.8 −0.1	34.22 .97	50.8 2.8	8.56 .16	67.5 2.0
26.3	44.68 .22	45.3 1.6	48.74 .11	23.9 0.2	33.18 1.10	53.4 2.4	8.39 .19	69.4 1.6
Oct. 6.3	44.44 .24	46.7 1.2	48.61 .13	24.2 0.3	32.01 1.22	55.6 2.0	8.18 .21	70.8 1.2
16.3	44.19 .26	47.7 0.7	48.47 .14	24.5 0.4	30.74 1.30	57.4 1.5	7.96 .23	71.8 0.8
26.3	43.92 −.26	48.1 +0.2	48.32 −.15	24.9 −0.4	29.41−1.35	58.7 +1.0	7.72 −.24	72.4 +0.3
Nov. 5.2	43.66 .25	48.1 −0.2	48.17 .14	25.4 0.5	28.04 1.37	59.4 +0.4	7.49 .23	72.4 −0.2
15.2	43.41 .24	47.6 0.7	48.04 .12	25.9 0.5	26.67 1.36	59.6 −0.1	7.26 .22	72.0 0.7
25.2	43.18 .22	46.5 1.3	47.93 .10	26.4 0.5	25.32 1.31	59.1 0.7	7.05 .20	71.2 1.1
Dec. 5.2	42.97 .19	45.0 1.7	47.84 .07	27.0 0.6	24.05 1.22	58.1 1.3	6.86 .17	69.8 1.5
15.1	42.80 −.15	43.1 −2.1	47.78 −.04	27.6 −0.6	22.89−1.09	56.6 −1.8	6.71 −.14	68.1 −1.9
25.1	42.68 .10	40.7 2.5	47.75 −.01	28.1 0.6	21.87 .93	54.5 2.3	6.58 .10	65.9 2.3
35.1	42.59 −.08	38.0 −2.8	47.76 +.03	28.6 −0.5	21.02− .74	51.9 −2.6	6.50 −.06	63.5 −2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		α Cephei.		1 Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	21h 1m	+38° 12′	21h 8m	+29° 46′	21h 15m	+62° 7′	21h 17m	+19° 20′
	s	″	s	″	s	″	s	″
Jan. 0.1	58.43 −.07	48.9 −2.3	15.68 −.06	46.6 −2.2	55.79 −.25	30.2 −2.5	0.68 −.05	14.7 −1.7
10.1	58.38 −.03	46.5 2.5	15.64 −.02	44.3 2.3	55.57 .18	27.5 2.9	0.65 −.01	12.9 1.8
20.0	58.37 +.01	43.9 2.6	15.64 +.01	42.0 2.4	55.42 .11	24.5 3.1	0.65 +.02	11.0 1.9
30.0	58.40 .06	41.2 2.6	15.67 .05	39.6 2.4	55.35 −.03	21.3 3.2	0.69 .05	9.1 1.9
Feb. 9.0	58.48 .10	38.6 2.5	15.74 .09	37.2 2.3	55.36 +.05	18.0 3.2	0.76 .09	7.2 1.8
19.0	58.61 +.14	36.2 −2.3	15.85 +.13	35.0 −2.1	55.45 +.13	14.8 −3.1	0.86 +.12	5.5 −1.6
28.9	58.77 .18	34.0 2.0	15.99 .17	33.0 1.8	55.62 .21	11.8 2.9	1.00 .15	4.1 1.3
Mar. 10.9	58.98 .22	32.1 1.7	16.18 .20	31.4 1.4	55.87 .29	9.1 2.5	1.17 .19	2.9 1.0
20.9	59.23 .26	30.6 1.2	16.40 .23	30.2 1.0	56.19 .35	6.8 2.1	1.38 .22	2.1 0.6
30.9	59.51 .30	29.7 0.7	16.65 .26	29.4 −0.5	56.58 .41	5.0 1.5	1.61 .25	1.7 −0.2
Apr. 9.8	59.82 +.32	29.2 −0.1	16.93 +.29	29.1 0.0	57.02 +.46	3.7 −0.9	1.87 +.27	1.8 +0.2
19.8	60.16 .34	29.4 +0.4	17.23 .31	29.3 +0.5	57.50 .49	3.1 −0.3	2.15 .29	2.2 0.6
29.8	60.51 .35	30.0 0.9	17.54 .32	30.0 0.9	58.00 .51	3.1 +0.3	2.45 .30	3.1 1.1
May 9.7	60.87 .36	31.3 1.4	17.87 .33	31.2 1.4	58.52 .52	3.7 0.9	2.76 .31	4.4 1.5
19.7	61.23 .35	32.9 1.9	18.20 .33	32.8 1.8	59.04 .51	4.9 1.5	3.08 .31	6.0 1.8
29.7	61.58 +.34	35.1 +2.3	18.52 +.32	34.8 +2.2	59.53 +.48	6.6 +2.0	3.39 +.30	7.9 +2.1
June 8.7	61.91 .32	37.6 2.6	18.83 .30	37.1 2.4	60.00 .44	8.9 2.5	3.70 .29	10.1 2.3
18.6	62.21 .29	40.4 2.9	19.12 .27	39.7 2.6	60.42 .39	11.5 2.9	3.98 .27	12.5 2.4
28.6	62.48 .25	43.4 3.1	19.38 .24	42.4 2.8	60.78 .33	14.6 3.2	4.24 .24	14.9 2.5
July 8.6	62.71 .21	46.5 3.2	19.60 .20	45.3 2.9	61.08 .26	17.8 3.4	4.47 .21	17.5 2.5
18.6	62.90 +.16	49.8 +3.2	19.78 +.16	48.2 +2.9	61.31 +.19	21.3 +3.5	4.66 +.17	20.0 +2.5
28.5	63.03 .11	53.0 3.2	19.92 .11	51.0 2.8	61.46 .11	24.9 3.6	4.80 .13	22.4 2.4
Aug. 7.5	63.11 +.06	56.2 3.1	20.00 .06	53.8 2.7	61.52 +.03	28.5 3.6	4.91 .08	24.8 2.2
17.5	63.14 .00	59.2 2.9	20.04 +.01	56.4 2.5	61.51 −.05	32.1 3.5	4.96 +.03	26.9 2.0
27.4	63.12 −.05	62.0 2.7	20.03 −.03	58.8 2.3	61.41 .13	35.5 3.3	4.98 −.01	28.9 1.8
Sept. 6.4	63.05 −.09	64.5 +2.4	19.98 −.07	61.0 +2.0	61.25 −.20	38.8 +3.1	4.94 −.05	30.6 +1.6
16.4	62.94 .13	66.8 2.1	19.88 .11	62.8 1.7	61.01 .26	41.7 2.8	4.88 .09	32.0 1.3
26.4	62.79 .16	68.7 1.7	19.75 .14	64.4 1.4	60.71 .32	44.4 2.4	4.77 .12	33.2 1.0
Oct. 6.3	62.61 .19	70.2 1.3	19.60 .16	65.6 1.0	60.37 .37	46.6 2.0	4.64 .14	34.1 0.7
16.3	62.41 .20	71.3 0.9	19.42 .18	66.5 0.6	59.98 .40	48.4 1.5	4.50 .15	34.7 0.4
26.3	62.20 −.21	72.0 +0.4	19.24 −.19	66.9 +0.2	59.57 −.42	49.7 +1.0	4.34 −.16	34.9 +0.1
Nov. 5.3	61.99 .21	72.2 0.0	19.05 .18	67.0 −0.2	59.14 .43	50.5 +0.5	4.18 .16	34.8 −0.2
15.2	61.79 .20	72.0 −0.4	18.87 .17	66.6 0.6	58.71 .42	50.7 −0.1	4.03 .15	34.5 0.5
25.2	61.60 .18	71.3 0.9	18.70 .16	65.8 1.0	58.29 .41	50.3 0.6	3.89 .13	33.8 0.8
Dec. 5.2	61.43 .15	70.2 1.3	18.55 .14	64.7 1.3	57.89 .38	49.4 1.2	3.76 .11	32.8 1.1
15.1	61.29 −.12	68.6 −1.7	18.43 −.11	63.2 −1.6	57.53 −.34	47.9 −1.7	3.66 −.09	31.5 −1.4
25.1	61.18 .09	66.7 2.1	18.34 .08	61.4 1.9	57.22 .29	45.9 2.2	3.59 .06	30.0 1.6
35.1	61.11 −.05	64.4 −2.4	18.28 −.04	59.3 −2.2	56.96 −.23	43.4 −2.7	3.54 −.03	28.3 −1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aquarii.		β Cephei.		ξ Aquarii.		ε Pegasi	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.
	$21^{h}\ 25^{m}$	$-\ 6^{\circ}\ 2'$	$21^{h}\ 27^{m}$	$+70^{\circ}\ 4'$	$21^{h}\ 31^{m}$	$-\ 8^{\circ}\ 20'$	$21^{h}\ 38^{m}$	$+\ 9^{\circ}\ 22'$
	s	″	s	″	s	″	s	″
Jan. 0.1	47.26 −.03	71.0 −0.7	11.58 −.42	61.9 −2.4	55.00 −.03	44.0 −0.5	48.05 −.05	26.1 −1.3
10.1	47.24 .00	71.6 0.6	11.21 .33	59.4 2.7	54.99 .00	44.5 0.5	48.02 −.02	24.8 1.3
20.1	47.26 +.03	72.2 0.5	10.93 .22	56.4 3.0	55.00 +.03	44.9 0.4	48.01 +.01	23.5 1.3
30.0	47.31 .06	72.7 0.4	10.76 −.12	53.2 3.2	55.04 .06	45.2 0.3	48.03 .04	22.2 1.2
Feb. 9.0	47.39 .09	73.0 0.3	10.70 .00	49.9 3.3	55.12 .09	45.4 −0.1	48.09 .07	20.9 1.1
19.0	47.50 +.12	73.2 −0.1	10.75 +.11	46.6 −3.2	55.22 +.12	45.5 +0.1	48.18 +.10	19.8 −1.0
28.9	47.64 .15	73.2 +0.1	10.92 .23	43.5 3.0	55.36 .15	45.3 0.3	48.30 .13	18.9 0.7
Mar. 10.9	47.81 .18	73.0 0.3	11.21 .34	40.6 2.7	55.52 .16	45.0 0.5	48.45 .17	18.3 0.5
20.9	48.01 .21	72.6 0.5	11.60 .44	38.0 2.3	55.72 .21	44.4 0.7	48.63 .20	18.0 −0.2
30.9	48.23 .24	71.8 0.8	12.08 .52	36.0 1.8	55.94 .24	43.6 0.9	48.84 .23	18.0 +0.2
Apr. 9.8	48.48 +.26	70.9 +1.0	12.64 +.59	34.5 −1.2	56.19 +.26	42.6 +1.1	49.06 +.25	18.3 +0.5
19.8	48.76 .28	69.8 1.2	13.26 .64	33.5 −0.6	56.46 .28	41.3 1.3	49.35 .28	19.0 0.9
29.8	49.05 .30	68.4 1.4	13.91 .66	33.2 0.0	56.76 .30	39.9 1.5	49.64 .30	20.1 1.2
May 9.8	49.36 .31	66.9 1.6	14.59 .67	33.5 +0.6	57.06 .31	38.4 1.6	49.94 .31	21.4 1.5
19.7	49.67 .31	65.3 1.7	15.26 .66	34.4 1.2	57.38 .32	36.7 1.7	50.25 .31	23.1 1.7
29.7	49.99 +.31	63.6 +1.7	15.91 +.63	36.0 +1.8	57.70 +.32	35.0 +1.7	50.56 +.31	24.9 +1.9
June 8.7	50.30 .30	61.8 1.7	16.52 .58	38.0 2.3	58.01 .31	33.3 1.7	50.87 .30	27.0 2.1
18.6	50.59 .28	60.1 1.7	17.07 .51	40.5 2.7	58.31 .29	31.6 1.6	51.16 .28	29.1 2.2
28.6	50.86 .26	58.4 1.6	17.55 .43	43.4 3.0	58.59 .27	30.0 1.5	51.43 .26	31.3 2.2
July 8.6	51.11 .23	56.9 1.5	17.94 .34	46.6 3.3	58.84 .23	28.6 1.4	51.68 .23	33.4 2.1
18.6	51.32 +.19	55.5 +1.3	18.23 +.24	50.1 +3.5	59.06 +.20	27.3 +1.2	51.89 +.19	35.6 +2.0
28.5	51.49 .15	54.4 1.1	18.42 .14	53.7 3.6	59.23 .16	26.2 1.0	52.06 .15	37.6 1.9
Aug. 7.5	51.62 .10	53.4 0.9	18.51 +.03	57.4 3.7	59.37 .11	25.4 0.8	52.19 .11	39.5 1.8
17.5	51.70 .06	52.6 0.7	18.48 −.07	61.0 3.6	59.46 .06	24.7 0.5	52.28 .06	41.2 1.6
27.5	51.74 +.02	52.0 0.5	18.35 .18	64.6 3.5	59.50 +.02	24.2 0.3	52.32 +.02	42.6 1.4
Sept. 6.4	51.73 −.02	51.6 +0.3	18.12 −.27	68.0 +3.3	59.51 −.02	24.0 +0.1	52.32 −.02	43.9 +1.1
16.4	51.69 .06	51.4 +0.1	17.80 .36	71.2 3.0	59.47 .06	23.9 0.0	52.28 .06	44.9 0.9
26.4	51.61 .09	51.4 −0.1	17.40 .44	74.1 2.7	59.40 .09	24.0 −0.2	52.20 .09	45.7 0.6
Oct, 6.3	51.51 .11	51.6 0.2	16.92 .51	76.6 2.3	59.30 .11	24.3 0.3	52.10 .11	46.3 0.4
16.3	51.38 .13	51.9 0.3	16.38 .56	78.7 1.8	59.18 .13	24.6 0.4	51.98 .13	46.6 +0.2
26.3	51.25 −.14	52.2 −0.4	15.80 −.60	80.3 +1.4	59.04 −.13	25.1 −0.5	51.85 −.14	46.6 0.0
Nov. 5.3	51.11 .13	52.7 0.5	15.19 .62	81.4 0.8	58.91 .13	25.6 0.5	51.71 .14	46.4 −0.3
15.2	50.98 .12	53.2 0.6	14.56 .62	82.0 +0.2	58.78 .12	26.1 0.6	51.57 .13	46.0 0.5
25.2	50.86 .11	53.8 0.6	13.95 .61	81.9 −0.3	58.66 .11	26.7 0.6	51.44 .12	45.4 0.7
Dec. 5.2	50.76 .09	54.5 0.6	13.35 .58	81.2 0.9	58.55 .09	27.3 0.6	51.33 .10	44.6 0.9
15.2	50.68 −.07	55.1 −0.6	12.80 −.53	80.0 −1.5	58.47 −.07	27.9 −0.6	51.23 −.08	43.7 −1.1
25.1	50.62 .04	55.8 0.6	12.30 .46	78.2 2.0	58.41 .04	28.4 0.6	51.16 .06	42.5 1.2
35.1	50.59 −.01	56.4 −0.6	11.87 −.38	75.9 −2.5	58.38 −.02	29.0 −0.5	51.11 −.04	41.3 −1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	11 Cephei.		μ Capricorni.		79 Draconis.		ε Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 40	° ′ +70 48	h m 21 47	° ′ −14 3	h m 21 51	° ′ +73 10	h m 22 0	° ′ − 0 50
	s	″	s	″	s	″	s	″
Jan. 0.1	16.02 −.46	41.4 −2.2	19.26 −.04	64.4 −0.3	26.61 −.56	79.7 −2.1	9.30 −.05	65.5 −0.8
10.1	15.60 .37	39.0 2.6	19.23 −.01	64.6 −0.1	26.09 .46	77.4 2.5	9.25 −.03	66.3 0.8
20.1	15.28 .27	36.2 2.9	19.23 +.02	64.7 0.0	25.68 .35	74.7 2.9	9.24 .00	67.0 0.7
30.0	15.06 .16	33.1 3.2	19.26 .05	64.6 +0.1	25.38 .23	71.7 3.1	9.25 +.03	67.8 0.6
Feb. 9.0	14.96 −.04	29.8 3.3	19.32 .08	64.5 0.2	25.22 −.10	68.5 3.2	9.29 .06	68.3 0.5
19.0	14.98 +.08	26.6 −3.2	19.42 +.11	64.1 +0.4	25.19 +.04	65.2 −3.2	9.36 +.09	68.8 −0.3
Mar. 1.0	15.12 .20	23.4 3.1	19.54 .14	63.6 0.6	25.30 .18	62.0 3.1	9.46 .12	69.0 −0.1
10.9	15.38 .31	20.4 2.8	19.69 .17	62 8 0.8	25.56 .31	59.0 2.9	9.60 .15	69.0 +0.1
20.9	15.75 .42	17.8 2.4	19.88 .20	61.9 1.0	25.93 .44	56.2 2.5	9.76 .17	68.8 0.4
30.9	16.22 .51	15.6 1.9	20.10 .23	60.8 1.2	26.43 .55	53.9 2.1	9.96 .21	68.3 0.6
Apr. 9.9	16.78 +.59	13.9 −1.4	20.34 +.26	59.5 +1.4	27.03 +.64	52.1 −1.6	10.19 +.24	67.5 +0.9
19.8	17.40 .65	12.8 0.8	20.61 .28	58.0 1.5	27.71 .71	50.9 1.0	10.44 .27	66.5 1.2
29.8	18.07 .68	12.4 −0.1	20.91 .30	56.5 1.6	28.45 .75	50.2 −0.3	10.72 .29	65.2 1.4
May 9.8	18.76 .70	12.5 +0.5	21.22 .31	54.8 1.7	29.22 .78	50.2 +0.3	11.01 .30	63.6 1.6
19.7	19.46 .69	13.3 1.0	21.54 .32	53.1 1.7	30.01 .78	50.7 0.9	11.32 .31	62.0 1.8
29.7	20.14 +.66	14.6 +1.6	21.86 +.33	51.4 +1.7	30.78 +.75	51.9 +1.4	11.64 +.31	60.1 +1.9
June 8.7	20.79 .62	16.5 2.1	22.19 .32	49.7 1.6	31.51 .70	53.6 1.9	11.95 .31	58.2 1.9
18.7	21.38 .56	18.9 2.6	22.50 .30	48.1 1.5	32.18 .64	55.9 2.4	12.26 .30	56.3 1.9
28.6	21.90 .47	21.7 3.0	22.79 .28	46.7 1.3	32.78 .55	58.5 2.8	12.54 .28	54.4 1.9
July 8.6	22.33 .38	24.8 3.3	23.06 .25	45.5 1.1	33.29 .45	61.6 3.2	12.81 .25	52.5 1.8
18.6	22.66 +.28	28.2 +3.5	23.30 +.21	44.4 +0.9	33.69 +.34	64.9 +3.4	13.04 +.21	50.8 +1.6
28.6	22.90 .18	31.8 3.6	23.49 .17	43.6 0.7	33.97 .22	68.4 3.6	13.24 .17	49.2 1.4
Aug. 7.5	23.02 +.07	35.5 3.7	23.65 .13	43.0 0.5	34.14 +.10	72.1 3.7	13.39 .13	47.9 1.2
17.5	23.04 −.04	39.2 3.7	23.76 .08	42.6 +0.3	34.18 −.02	75.8 3.7	13.50 .09	46.7 1.0
27.5	22.94 .14	42.8 3.6	23.82 +.04	42.5 0.0	34.10 .14	79.5 3.6	13.57 .05	45.8 0.8
Sept. 6.4	22.74 −.25	46.3 +3.4	23.84 .00	42.6 −0.2	33.90 −.25	83.1 +3.5	13.60 +.01	45.0 +0.6
16.4	22.44 .34	49.6 3.2	23.82 −.04	42.8 0.3	33.59 .36	86.6 3.3	13.58 −.03	44.5 0.4
26.4	22.06 .42	52.7 2.9	23.76 .07	43.2 0.4	33.18 .46	89.7 3.0	13.53 .06	44.2 +0.2
Oct. 6.4	21.59 .50	55.4 2.5	23.67 .10	43.7 0 5	32.68 .54	92.6 2.7	13.46 .09	44.1 0.0
16.3	21.06 .56	57.6 2.0	23.55 .12	44.3 0.6	32.09 .62	95.0 2.2	13.35 .11	44.2 −0.1
26.3	20.48 −.60	59.4 +1.5	23.43 −.13	44.9 −0.6	31.44 −.67	97.0 +1.7	13.23 −.12	44.4 −0.3
Nov. 5.3	19.86 .62	60.8 1.0	23.29 .13	45.5 0.6	30.75 .71	98.5 1.2	13.11 .13	44.8 0.4
15.3	19.23 .64	61.5 +0.5	23.16 .13	46.1 0.6	30.02 .73	99.5 0.6	12.98 .12	45.3 0.5
25.2	18.59 .63	61.6 −0.1	23.04 .12	46.7 0.5	29.29 .73	99.8 +0.1	12.86 .11	45.9 0.6
Dec. 5.2	17.96 .61	61.2 0.7	22.93 .10	47.2 0.5	28.56 .70	99.6 −0.5	12.75 .10	46.5 0.7
15.2	17.38 −.56	60.2 −1.3	22.84 −.08	47.7 −0.4	27.87 −.67	98.8 −1.1	12.66 −.08	47.3 −0.8
25.1	16.84 .50	58.6 1.9	22.77 .05	48.0 0.3	27.23 .60	97.4 1.7	12.58 .06	48.0 0.8
35.1	16.38 −.43	56.4 −2.4	22.73 −.03	48.3 −0.2	26.66 −.52	95.4 −2.2	12.53 −.04	48.8 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Gruis.		θ Aquarii.		π Aquarii.		η Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 1	° ′ −47 29	h m 22 11	° ′ − 8 19	h m 22 19	° ′ + 0 49	h m 22 29	° ′ − 0 40
	s	″	s	″	s	″	s	″
Jan. 0.1	19.37 −.09	37.7 +1.2	3.12 −.06	43.6 −0.5	40.90 −.06	20.1 −0.9	43.62 −.07	53.4 −0.8
10.1	19.29 .05	36.3 1.5	3.07 .03	44.1 0.4	40.84 .04	19.2 0.8	43.56 .05	54.1 0.7
20.1	19.25 −.01	34.6 1.8	3.05 −.01	44.5 0.3	40.81 −.02	18.4 0.8	43.52 −.03	54.9 0.7
30.1	19.26 +.03	32.7 2.1	3.06 +.02	44.7 −0.2	40.81 +.01	17.7 0.7	43.51 .00	55.5 0.6
Feb. 9.0	19.32 .08	30.5 2.3	3.09 .05	44.8 0.0	40.83 .04	17.0 0.6	43.52 +.03	56.0 0.5
19.0	19.42 +.12	28.2 +2.4	3.16 +.08	44.8 +0.1	40.88 +.07	16.5 −0.4	43.56 +.06	56.4 −0.3
Mar. 1.0	19.56 .17	25.7 2.5	3.25 .11	44.6 0.3	40.96 .10	16.2 −0.2	43.63 .09	56.6 −0.1
11.0	19.75 .21	23.2 2.6	3.38 .14	44.1 0.5	41.07 .13	16.1 0.0	43.74 .12	56.6 +0.1
20.9	19.98 .26	20.6 2.6	3.53 .17	43.4 0.8	41.22 .16	16.3 +0.3	43.87 .15	56.4 0.4
30.9	20.26 .30	18.0 2.5	3.73 .20	42.5 1.0	41.40 .19	16.7 0.6	44.04 .19	55.8 0.7
Apr. 9.9	20.58 +.34	15.6 +2.4	3.95 +.23	41.4 +1.2	41.61 +.22	17.5 +0.9	44.25 +.22	55.0 +0.9
19.8	20.93 .37	13.2 2.2	4.20 .26	40.1 1.4	41.85 .25	18.5 1.1	44.48 .25	54.0 1.2
29.8	21.32 .40	11.1 2.0	4.47 .28	38.5 1.6	42.12 .28	19.7 1.4	44.75 .27	52.6 1.4
May 9.8	21.73 .42	9.2 1.8	4.77 .30	36.9 1.7	42.41 .30	21.2 1.6	45.03 .29	51.1 1.6
19.8	22.16 .43	7.5 1.5	5.08 .31	35.1 1.8	42.71 .31	22.9 1.8	45.34 .31	49.4 1.8
29.7	22.60 +.44	6.1 +1.2	5.40 +.32	33.2 +1.8	43.03 +.32	24.8 +1.9	45.65 +.32	47.5 +1.9
June 8.7	23.03 .43	5.1 0.8	5.72 .32	31.4 1.8	43.34 .31	26.7 2.0	45.97 .31	45.6 2.0
18.7	23.46 .41	4.4 +0.4	6.04 .31	29.6 1.7	43.65 .30	28.7 2.0	46.28 .30	43.6 2.0
28.6	23.86 .39	4.1 0.0	6.34 .29	27.9 1.6	43.95 .28	30.7 1.9	46.58 .29	41.6 1.9
July 8.6	24.23 .35	4.3 −0.3	6.61 .26	26.3 1.5	44.22 .26	32.7 1.8	46.86 .27	39.7 1.8
18.6	24.56 +.30	4.8 −0.7	6.86 +.23	24.9 +1.3	44.47 +.23	34.5 +1.7	47.11 +.24	37.9 +1.7
28.6	24.84 .25	5.6 1.0	7.06 .19	23.7 1.1	44.68 .19	36.2 1.6	47.33 .20	36.3 1.5
Aug. 7.5	25.07 .19	6.8 1.3	7.23 .15	22.7 0.9	44.85 .15	37.7 1.4	47.51 .16	34.8 1.3
17.5	25.23 .13	8.3 1.6	7.36 .10	21.9 0.6	44.98 .11	39.0 1.2	47.66 .12	33.6 1.1
27.5	25.33 .07	10.0 1.8	7.44 .06	21.4 0.4	45.06 .06	40.1 1.0	47.75 .07	32.6 0.9
Sept. 6.5	25.36 +.01	11.9 −1.9	7.48 +.02	21.1 +0.2	45.11 +.02	40.9 +0.7	47.81 +.03	31.8 +0.7
16.4	25.34 −.05	13.8 1.9	7.48 −.02	21.0 0.0	45.11 −.01	41.5 0.5	47.82 .00	31.3 0.4
26.4	25.26 .10	15.7 1.9	7.44 .05	21.1 −0.2	45.08 .05	41.9 0.3	47.80 −.04	30.9 +0.2
Oct. 6.4	25.13 .15	17.6 1.7	7.38 .08	21.4 0.3	45.02 .08	42.1 +0.1	47.74 .07	30.8 0.0
16.3	24.96 .18	19.2 1.5	7.28 .10	21.8 0.4	44.93 .10	42.2 −0.1	47.66 .09	30.8 −0.1
26.3	24.76 −.20	20.6 −1.3	7.17 −.12	22.2 −0.5	44.82 −.11	42.0 −0.2	47.56 −.11	31.1 −0.3
Nov. 5.3	24.55 .22	21.8 1.0	7.05 .12	22.8 0.6	44.71 .12	41.7 0.4	47.45 .12	31.4 0.4
15.3	24.33 .21	22.5 0.6	6.92 .12	23.4 0.6	44.58 .12	41.3 0.5	47.33 .12	31.9 0.5
25.2	24.12 .20	22.9 −0.2	6.80 .11	24.0 0.6	44.46 .12	40.7 0.6	47.22 .11	32.4 0.6
Dec. 5.2	23.92 .18	22.9 +0.2	6.69 .10	24.6 0.6	44.35 .11	40.0 0.7	47.10 .10	33.1 0.7
15.2	23.75 −.15	22.4 +0.6	6.59 −.09	25.2 −0.6	44.25 −.09	39.3 −0.8	47.00 −.09	33.8 −0.7
25.2	23.61 .12	21.6 1.0	6.52 .07	25.8 0.5	44.17 .07	38.5 0.8	46.92 .08	34.5 0.7
35.1	23.51 −.08	20.4 +1.3	6.46 −.05	26.3 −0.5	44.10 −.05	37.7 −0.8	46.85 −.06	35.3 −0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei(B.)		ζ Pegasi.		ι Cephei.		λ Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 30	° ′ +75 39	h m 22 35	° ′ +10 15	h m 22 45	° ′ +65 37	h m 22 46	° ′ − 8 9
	s	″	s	″	s	″	s	″
Jan. 0.2	17.84 −.74	62.6 −1.5	59.89 −.06	39.9 −1.0	45.39 −.41	46.6 −1.4	54.09 −.08	44.7 −0.5
10.1	17.14 .65	60.8 2.0	59.82 .06	38.8 1.1	45.00 .35	44.9 1.9	54.02 .06	45.2 0.4
20.1	16.54 .54	58.6 2.4	59.76 .04	37.6 1.2	44.67 .30	42.8 2.4	53.98 .04	45.6 0 3
30.1	16.05 .41	55.9 2.8	59.74 −.02	36.5 1.1	44.39 .24	40.2 2.7	53.95 −.01	45.8 −0.2
Feb. 9.0	15.70 .27	52.9 3.1	59.73 +.01	35.3 1.0	44.19 .16	37.3 2.9	53.95 +.01	45.9 0.0
19.0	15.51 −.11	49.7 −3.2	59.76 +.04	34.3 −0 9	44.08 −.07	34.3 −3.0	53.97 +.04	45.8 +0.2
Mar. 1.0	15.48 +.05	46.5 3.2	59.82 .08	33.5 0.7	44.06 +.03	31.2 3.0	54.03 .07	45.5 0.4
11.0	15.62 .21	43.4 3.0	59.92 .11	32.8 0.5	44.14 .12	28.2 2.9	54.12 .10	45.0 0.6
20.9	15.92 .37	40.4 2.7	60.05 .15	32.5 −0.2	44.31 .22	25.4 2.7	54.24 .14	44.2 0.8
30.9	16.37 .52	37.8 2.4	60.21 .18	32.4 +0.1	44.57 .31	22.9 2.3	54.40 .17	43.3 1.1
Apr. 9.9	16.96 +.64	35.6 −2.0	60.41 +.22	32.7 +0.4	44.93 +.39	20.8 −1.9	54.59 +.21	42.1 +1.3
19.9	17.66 .75	33.9 1.5	60.64 .25	33.3 0.7	45.35 .46	19.2 1.4	54.82 .24	40.7 1.5
29.8	18.45 .82	32.7 0.9	60.90 .27	34.2 1.1	45.84 .51	18.1 0.8	55.07 .27	39.1 1.7
May 9.8	19.31 .88	32.2 −0.3	61.19 .29	35.5 1.4	46.39 .55	17.6 −0.2	55.36 .29	37.3 1.8
19.8	20.21 .90	32.2 +0.3	61.49 .31	37.0 1.6	46.96 .58	17.7 +0.4	55.66 .31	35.5 1.9
29.7	21.12 +.89	32.8 +0.9	61.81 +.32	38.8 +1.9	47.55 +.59	18.4 +0.9	55.97 +.32	33.5 +2.0
June 8.7	22.01 .86	34.1 1.5	62.13 .31	40.8 2.1	48.13 .58	19.6 1.5	56.29 .32	31.6 2.0
18.7	22.85 .81	35.8 2.0	62.44 .30	42.9 2.2	48.70 .55	21.4 2.0	56.62 .31	29.6 1.9
28.7	23.62 .73	38.1 2.5	62.74 .29	45.1 2.2	49.23 .51	23.6 2.5	56.92 .30	27.8 1.8
July 8.6	24.31 .63	40.8 2.9	63.02 .27	47.3 2.2	49.72 .45	26.3 2.8	57.22 .26	26.1 1.6
18.6	24.89 +.52	43.8 +3.2	63.28 +.24	49.5 +2.1	50.14 +.39	29.3 +3.1	57.49 +.25	24.5 +1.4
28.6	25.36 .40	47.2 3.4	63.50 .20	51.6 2.0	50.50 .32	32.6 3.3	57.72 .22	23.2 1.2
Aug. 7.6	25.69 .27	50.8 3.6	63.68 .16	53.6 1.9	50.78 .23	36.1 3.6	57.92 .18	22.1 1.0
17.5	25.89 +.13	54.5 3.7	63.82 .12	55.4 1.7	50.97 .15	39.8 3.7	58.08 .14	21.2 0.7
27.5	25.95 −.01	58.2 3.8	63.92 .08	57.1 1.5	51.08 +.06	43.4 3.7	58.20 .09	20.6 0.5
Sept. 6.5	25.87 −.14	62.0 +3.7	63.97 +.04	58.5 +1.3	51.10 −.02	47.1 +3.6	58.27 +.05	20.3 +0.2
16.4	25.66 .27	65.7 3.6	63.99 .00	59.7 1.1	51.04 .10	50.7 3.5	58.31 +.01	20.2 0.0
26.4	25.32 .40	69.2 3.4	63.97 −.04	60.7 0.8	50.91 .17	54.1 3.3	58.30 −.02	20.2 −0.2
Oct. 6.4	24.86 .51	72.4 3.1	63.92 .07	61.4 0.6	50.70 .24	57.2 3.0	58.26 .05	20.5 0.3
16.4	24.30 .61	75.3 2.7	63.84 .09	61.9 0.4	50.42 .31	60.1 2.7	58.20 .08	20 9 0.5
26.3	23.65 −.69	77.9 +2.3	63.74 −.11	62.1 +0.1	50.09 −.36	62.5 +2.3	58.11 −.10	21.4 −0.6
Nov. 5.3	22.91 .76	80.0 1.8	63.63 .12	62.2 −0.1	49.71 .40	64.5 1.8	58.00 .11	22.0 0.6
15.3	22.12 .81	81.5 1.3	63.50 .12	62.0 0.3	49.29 .43	66.0 1.2	57.89 .11	22.7 0.7
25.3	21.29 .84	82.5 0.7	63.38 .12	61.6 0.5	48.85 .45	67.0 0.7	57.78 .11	23.3 0.7
Dec. 5.2	20.44 .84	82.9 +0.1	63.27 .11	61.0 0.7	48.40 .45	67.4 +0.1	57.66 .11	24.0 0.6
15.2	19.60 −.82	82.7 −0.5	63.16 −.10	60.2 −0.8	47.95 −.44	67.2 −0.5	57.56 −.10	24.6 −0.6
25.2	18.80 .78	81.9 1.1	63.06 .09	59.3 1.0	47.51 .42	66.4 1.0	57.47 .08	25.2 0.5
35.1	18.05 −.70	80.5 −1.7	62.98 −.07	58.3 −1.1	47.10 −.39	65.1 −1.6	57.39 −.07	25.7 −0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Piscis Australis. (*Fomalhaut.*)		α Pegasi. (*Markab.*)		ο Cephei.		θ Piscium.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$22^{h}\ 51^{m}$	$-30^{\circ}\ 11'$	$22^{h}\ 59^{m}$	$+14^{\circ}\ 36'$	$23^{h}\ 14^{m}$	$+67^{\circ}\ 30'$	$23^{h}\ 22^{m}$	$+\ 5^{\circ}\ 46'$
	s	″	s	″	s	″	s	″
Jan. 0.2	35.94 −.10	76.4 +0.2	18.31 −.10	64.3 −1.1	6.72 −.47	65.3 −1.0	24.90 −.10	42.5 −0.8
10.2	35.85 .07	76.1 0.5	18.22 .08	63.2 1.2	6.27 .43	64.0 1.6	24.81 .09	41.6 0.9
20.1	35.79 .05	75.4 0.8	18.15 .06	62.0 1.2	5.86 .38	62.2 2.0	24.73 .07	40.8 0.8
30.1	35.76 −.02	74.5 1.1	18.10 .04	60.7 1.3	5.51 .31	59.9 2.4	24.67 .05	40.0 0.8
Feb. 9.1	35.75 +.01	73.3 1.3	18.08 −.01	59.4 1.2	5.23 .23	57.2 2.7	24.63 −.03	39.2 0.7
19.0	35.77 +.04	71.9 +1.5	18.08 +.02	58.2 −1.1	5.04 −.14	54.4 −2.9	24.62 .00	38.5 −0.6
Mar. 1.0	35.83 .08	70.3 1.7	18.11 .05	57.2 0.9	4.94 −.04	51.4 3.0	24.63 +.03	38.0 0.4
11.0	35.93 .11	68.5 1.9	18.18 .09	56.3 0.7	4.95 +.06	48.3 3.0	24.68 .06	37.7 −0.2
21.0	36.06 .15	66.5 2.1	18.29 .12	55.7 0.5	5.06 .17	45.4 2.8	24.76 .10	37.6 0.0
30.9	36.23 .19	64.4 2.2	18.43 .16	55.4 −0.2	5.28 .27	42.8 2.5	24.88 .14	37.8 +0.3
Apr. 9.9	36.44 +.23	62.1 +2.3	18.61 +.20	55.4 +0.2	5.60 +.36	40.4 −2.1	25.04 +.18	38.3 +0.6
19 9	36.69 .26	59.8 2.3	18.83 .23	55.7 0.5	6.01 .44	38.5 1.7	25.24 .21	39.0 0.9
29.9	36.97 .29	57.6 2.3	19.08 .26	56.4 0.9	6.50 .52	37.1 1.1	25.47 .24	40.1 1.2
May 9.8	37.28 .32	55.3 2.2	19.35 .29	57.5 1.2	7.05 .57	36.3 −0.6	25.73 .27	41.4 1.5
19.8	37.61 .34	53.2 2.1	19.65 .31	58.9 1.5	7.64 .61	36.0 0.0	26.01 .29	43.0 1.7
29.8	37.96 +.35	51.2 +1.9	19.97 +.32	60.5 +1.8	8.27 +.63	36.3 +0.6	26.32 +.31	44.8 +1.9
June 8.7	38.32 .36	49.3 1.7	20.29 .32	62.4 2.0	8.90 .63	37.2 1.1	26.63 .32	46.7 2.0
18.7	38.68 .35	47.8 1.5	20.61 .32	64.5 2.2	9.53 .61	38.6 1.7	26.95 .32	48.8 2.1
28.7	39.03 .34	46.4 1.2	20.92 .30	66.8 2.3	10.13 .58	40.5 2.2	27.27 .31	50.9 2.1
July 8.7	39.36 .32	45.5 0.8	21.22 .28	69.1 2.3	10.69 .53	42.9 2.6	27.57 .29	53.0 2.1
18.6	39.67 +.29	44.8 +0.5	21.49 +.25	71.4 +2.3	11.19 +.47	45.6 +2.9	27.85 +.27	55.1 +2.0
28.6	39.94 .25	44.5 +0.1	21.72 .22	73.7 2.2	11.63 .40	48.7 3.2	28.10 .24	57.0 1.9
Aug. 7.6	40.17 .21	44.5 −0.2	21.93 .18	75.9 2.1	11.99 .32	52.1 3.5	28.32 .20	58.9 1.7
17.6	40.36 .16	44.9 0.5	22.09 .14	77.9 2.0	12.27 .23	55.7 3.6	28.51 .16	60.5 1.5
27.5	40.50 .11	45.6 0.8	22.21 .10	79.8 1.8	12.46 .15	59.4 3.7	28.65 .12	62.0 1.3
Sept. 6.5	40.59 +.07	46.5 −1.0	22.29 +.06	81.5 +1.6	12.56 +.06	63.1 +3.7	28.76 +.08	63.2 +1.1
16.5	40.63 +.02	47.6 1.2	22.33 +.02	83.0 1.4	12.57 −.03	66.7 3.6	28.82 .04	64.2 0.9
26.5	40.63 −.02	48.9 1.3	22.33 −.01	84.3 1.1	12.50 .11	70.3 3.5	28.85 +.01	64.9 0.6
Oct. 6.4	40.58 .06	50.3 1.4	22.30 .05	85.3 0.9	12.35 .19	73.7 3.2	28.84 −.02	65.5 0.4
16.4	40.50 .09	51.7 1.4	22.23 .07	86.0 0.6	12.12 .26	76.8 2.9	28.81 .05	65.8 +0.2
26.4	40.40 −.12	53.1 −1.3	22.15 −.09	86.5 +0.4	11.82 −.33	79.6 +2.6	28.74 −.07	65.9 0.0
Nov. 5.3	40.27 .13	54.3 1.2	22.05 .11	86.8 +0.1	11.46 .38	81.9 2.2	28.66 .09	65.8 −0.2
15.3	40.13 .14	55.4 1.0	21.93 .12	86.8 −0.1	11.05 .43	83.8 1.7	28.57 .10	65.6 0.3
25.3	39.99 .14	56.3 0.8	21.82 .12	86.6 0.3	10.61 .46	85.2 1.1	28.46 .11	65.2 0.5
Dec. 5.3	39.85 .13	56.9 0.5	21.70 .12	86.1 0.6	10.13 .48	86.1 +0.5	28.36 .11	64.6 0.6
15.2	39.72 −.12	57.3 −0.2	21.58 −.11	85.4 −0.8	9.65 −.49	86.3 0.0	28.25 −.11	64.0 −0.7
25.2	39.60 .10	57.3 +0.1	21.47 .10	84.6 0.9	9.16 .48	86.0 −0.6	28.15 .10	63.3 0.8
35.2	39.51 −.09	57.1 +0.3	21.38 −.09	83.5 −1.1	8.69 −.46	85.0 −1.2	28.05 −.09	62.5 −0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium.		γ Cephei.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	$23^{h}\ 34^{m}$	$+\ 5^{\circ}\ 1'$	$23^{h}\ 34^{m}$	$+77^{\circ}\ 1'$	$23^{h}\ 49^{m}$	$+73^{\circ}\ 47'$	$23^{h}\ 53^{m}$	$+\ 6^{\circ}\ 15'$
	s	″	s	″	s	″	s	″
Jan. 0.2	19.28 −.10	61.6 −0.8	49.33 −.90	38.3 −0.6	29.64 −.70	85.7 −0.4	41.60 −.11	29.7 −0.7
10.2	19.19 .09	60.8 0.8	48.46 .85	37.4 1.2	28.95 .67	85.0 1.0	41.50 .10	28.9 0.8
20.2	19.11 .07	60.0 0.8	47.64 .77	36.0 1.7	28.30 .62	83.7 1.6	41.40 .09	28.2 0.8
30.1	19.04 .06	59.2 0.8	46.91 .66	34.0 2.2	27.71 .54	81.8 2.1	41.32 .07	27.4 0.7
Feb. 9.1	18.99 .04	58.5 0.7	46.31 .53	31.6 2.6	27.21 .45	79.5 2.5	41.26 .05	26.6 0.7
19.1	18.97 −.01	57.9 −0.5	45.85 −.38	28.8 −2.9	26.81 −.33	76.9 −2.8	41.22 −.03	26.0 −0.6
Mar. 1.1	18.97 +.02	57.4 0.4	45.55 .21	25.8 3.0	26.54 .20	74.0 3.0	41.20 .00	25.5 0.4
11.0	19.01 .05	57.2 −0.2	45.43 −.03	22.7 3.1	26.41 −.06	70.9 3.0	41.22 +.03	25.2 −0.2
21.0	19.08 .09	57.1 +0.1	45.49 +.15	19.6 3.0	26.43 +.09	67.9 2.9	41.27 .07	25.1 0.0
30.9	19.19 .13	57.3 0.4	45.73 .33	16.7 2.8	26.59 .23	65.0 2.8	41.36 .11	25.3 +0.3
Apr. 9.9	19.34 +.17	57.8 +0.6	46.15 +.50	14.0 −2.5	26.90 +.37	62.4 −2.5	41.49 +.15	25.7 +0.6
19.9	19.52 .20	58.6 0.9	46.73 .65	11.8 2.1	27.34 .49	60.0 2.1	41.66 .19	26.4 0.9
29.9	19.75 .24	59.7 1.2	47.45 .77	9.9 1.6	27.90 .61	58.1 1.7	41.86 .22	27.4 1.1
May 9.9	20.00 .27	61.0 1.4	48.28 .88	8.6 1.0	28.56 .70	56.7 1.1	42.11 .25	28.7 1.4
19.8	20.28 .29	62.6 1.7	49.21 .95	7.8 −0.5	29.30 .77	55.9 −0.6	42.38 .28	30.2 1.6
29.8	20.58 +.31	64.4 +1.9	50.18 +.99	7.6 +0.1	30.10 +.81	55.6 0.0	42.67 +.30	31.9 +1.8
June 8.8	20.90 .32	66.3 2.0	51.19 1.01	8.0 0.6	30.94 .84	55.8 +0.6	42.98 .32	33.8 2.0
18.7	21.22 .32	68.3 2.1	52.20 .99	8.9 1.2	31.78 .83	56.7 1.1	43.30 .32	35.8 2.1
28.7	21.53 .31	70.4 2.1	53.17 .95	10.4 1.7	32.60 .81	58.1 1.6	43.62 .32	37.9 2.1
July 8.7	21.84 .30	72.5 2.0	54.09 .88	12.5 2.2	33.39 .76	60.0 2.1	43.93 .31	40.0 2.1
18.7	22.13 +.27	74.6 +2.0	54.93 +.79	14.9 +2.6	34.12 +.69	62.3 +2.5	44.23 +.29	42.1 +2.0
28.6	22.39 .24	76.5 1.9	55.67 .68	17.8 3.0	34.77 .61	65.1 2.9	44.50 .26	44.1 1.9
Aug. 7.6	22.62 .21	78.3 1.7	56.29 .56	21.0 3.3	35.34 .52	68.2 3.2	44.75 .23	46.0 1.8
17.6	22.82 .17	79.9 1.5	56.79 .43	24.4 3.5	35.81 .42	71.6 3.5	44.96 .19	47.6 1.6
27.6	22.97 .14	81.3 1.3	57.16 .29	28.1 3.7	36.17 .31	75.1 3.7	45.13 .15	49.1 1.4
Sept. 6.5	23.09 +.10	82.5 +1.0	57.38 +.15	31.9 +3.8	36.42 +.19	78.8 +3.8	45.27 +.12	50.4 +1.2
16.5	23.17 .06	83.4 0.8	57.45 .00	35.7 3.8	36.56 +.08	82.6 3.8	45.36 .08	51.5 0.9
26.5	23.21 +.02	84.1 0.6	57.38 −.14	39.5 3.7	36.57 −.04	86.4 3.7	45.42 .04	52.3 0.7
Oct. 6.4	23.22 −.01	84.6 0.4	57.18 .29	43.2 3.6	36.48 .15	90.0 3.6	45.45 +.01	52.8 0.5
16.4	23.19 .04	84.9 +0.2	56.83 .41	46.6 3.4	36.27 .26	93.5 3.4	45.44 −.02	53.2 0.3
26.4	23.14 −.06	85.0 0.0	56.36 −.53	49.8 +3.0	35.96 −.36	96.7 +3.1	45.41 −.04	53.4 +0.1
Nov. 5.4	23.07 .08	84.9 −0.2	55.77 .64	52.7 2.6	35.54 .45	99.6 2.7	45.35 .06	53.3 −0.1
15.3	22.98 .09	84.6 0.3	55.08 .73	55.1 2.2	35.05 .53	102.1 2.2	45.28 .08	53.1 0.3
25.3	22.89 .10	84.2 0.5	54.30 .81	57.0 1.7	34.48 .60	104.1 1.7	45.19 .09	52.8 0.4
Dec. 5.3	22.78 .10	83.7 0.6	53.45 .87	58.4 1.1	33.84 .65	105.6 1.2	45.09 .10	52.3 0.5
15.3	22.68 −.10	83.0 −0.7	52.56 −.90	59.2 +0.5	33.17 −.68	106.5 +0.6	44.99 −.10	51.7 −0.6
25.2	22.58 .10	82.3 0.7	51.66 .90	59.4 −0.1	32.47 .70	106.8 0.0	44.89 .10	51.1 0.7
35.2	22.48 −.09	81.6 −0.8	50.76 −.87	58.9 −0.6	31.78 −.69	106.5 −0.6	44.78 −.10	50.4 −0.8

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cassiop.	22 Androm.	σ Androm.	ι Ceti.	6 Urs. Min., S. P.	44 Piscium.	π Androm.	o Cassiop.
	31° 27′	44° 32′	53° 49′	99° 26′	358° 18′	88° 40′	56° 53′	42° 19
	h m 0 3	h m 0 4	h m 0 12	h m 0 13	h m 0 13	h m 0 19	h m 0 31	h m 0 38
	s	s	s	s	s	s	s	s
(Dec. 30.3)	20.19 − .33	37.99 − .22	36.76 − .16	51.19 − .09	89.36 + 7.76	47.80 − .12	2.41 − .18	37.89 − .23
Jan. 9.2	19.87 .31	37.78 .20	36.60 .16	51.10 .10	97.12 7.65	47.68 .11	2.23 .17	37.66 .23
19.2	19.56 .29	37.59 .19	36.45 .15	51.00 .10	104.66 7.28	47.60 .10	2.08 .16	37.43 .23
29.2	19.29 − .26	37.40 − .18	36.30 − .14	50.91 − .09	111.68 + 6.64	47.51 − .09	1.93 − .15	37.21 − .21
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Aug. 26.6	24.58 + .25	41.80 + .19	40.31 + .20	54.58 + .18	54.88 − 3.00	51.10 + .16	5.74 + .21	41.43 + .25
Sept. 5.5	24.79 .17	41.97 .15	40.49 .15	54.74 .14	52.30 2.13	51.25 .14	5.93 .17	41.66 .20
15.5	24.92 .10	42.09 .10	40.62 .10	54.86 .10	50.71 − 1.07	51.38 .12	6.08 .13	41.84 .15
25.5	25.00 + .06	42.17 + .05	40.70 .06	54.94 .07	50.17 .00	51.47 .08	6.18 .09	41.97 .10
Oct. 5.5	25.02 − .01	42.20 .00	40.74 + .02	55.00 + .04	50.73 + 1.11	51.52 .04	6.26 .05	42.05 .06
15.4	24.97 − .07	42.18 − .04	40.75 − .02	55.01 .00	52.39 + 2.20	51.55 + .01	6.29 + .01	42.09 + .02
25.4	24.88 .12	42.13 .07	40.72 .05	54.99 − .03	55.13 3.28	51.54 − .02	6.28 − .02	42.08 − .03
Nov. 4.4	24.73 .17	42.04 .11	40.66 .08	54.96 .05	58.96 4.34	51.51 .04	6.25 .05	42.03 .07
14.4	24.54 .22	41.91 .14	40.57 .10	54.89 .07	63.80 5.30	51.45 .06	6.19 .08	41.94 .10
24.3	24.29 .25	41.76 .16	40.46 .12	54.81 .08	69.56 6.14	51.38 .08	6.10 .10	41.82 .13
Dec. 4.3	24.04 − .27	41.59 − .18	40.33 − .14	54.72 − .09	76.08 + 6.84	51.29 − .09	5.99 − .11	41.67 − .16
14.3	23.74 .30	41.40 .19	40.18 .15	54.62 .10	83.23 7.36	51.20 .09	5.87 .13	41.50 .18
24.2	23.43 .31	41.21 .20	40.02 .16	54.51 .10	90.81 7.66	51.11 .10	5.73 .15	41.30 .20
34.2	23.12 − .32	41.00 − .21	39.87 − .16	54.41 − .10	98.55 + 7.71	51.00 − .10	5.57 − .17	41.09 − .22

Mean Solar Date.	δ Piscium.	γ Cassiop.	μ Androm.	43 Cephei.	κ Tucanæ.	f Piscium.	κ Octantis, S. P.	υ Androm.
	83° 0′	29° 52′	52° 6′	4° 20′	159° 27′	86° 58′	184° 46′	49° 8′
	h m 0 43	h m 0 50	h m 0 50	h m 0 53	h m 1 12	h m 1 12	h m 1 23	h m 1 30
	s	s	s	s	s	s	s	s
(Dec. 30.3)	0.64 − .11	6.64 − .34	41.12 − .16	52.77 − 2.85	4.86 − .54	9.78 − .11	16.50 + 2.83	23.22 − .16
Jan. 9.2	0.53 .12	6.30 .34	40.95 .17	49.92 2.84	4.32 .53	9.66 .11	19.33 2.83	23.05 .18
19.2	0.41 .11	5.96 .33	40.78 .17	47.08 2.81	3.80 .51	9.55 .11	22.16 2.78	22.86 .21
29.2	0.31 − .10	5.63 − .32	40.60 − .17	44.30 − 2.74	3.30 − .49	9.43 − .11	24.87 + 2.64	22.64 − .23
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 5.6	3.91 + .15	10.87 + .26	44.60 + .20	68.10 + 1.50	9.13 + .40	12.78 + .21	12.23 − 1.69	26.40 + .26
15.5	4.05 .13	11.11 .21	44.78 .15	69.40 1.10	9.49 .32	12.97 .16	10.84 1.17	26.64 .21
25.5	4.17 .10	11.30 .15	44.91 .11	70.28 .68	9.77 .22	13.10 .12	9.89 .72	26.83 .17
Oct. 5.5	4.24 .07	11.40 .08	45.01 .08	70.75 + .26	9.92 + .11	13.21 .09	9.40 − .25	26.99 .13
15.5	4.30 + .04	11.46 + .03	45.07 + .04	70.80 − .17	9.98 .00	13.29 .06	9.39 + .25	27.10 .09
25.4	4.31 .00	11.46 − .03	45.09 .00	70.41 − .61	9.93 − .11	13.33 + .03	9.90 + .74	27.17 + .06
Nov. 4.4	4.29 − .03	11.39 .09	45.07 − .03	69.58 1.04	9.76 .21	13.34 .00	10.88 1.20	27.21 + .02
14.4	4.27 .05	11.27 .15	45.02 .06	68.33 1.45	9.51 .30	13.33 − .02	12.38 1.70	27.21 − .02
24.4	4.21 .07	11.09 .20	44.94 .09	66.69 1.83	9.16 .38	13.29 .04	14.27 2.08	27.17 .06
Dec. 4.3	4.14 .08	10.87 .24	44.84 .12	64.66 2.20	8.74 .44	13.24 .06	16.54 2.41	27.09 .09
14.3	4.05 − .09	10.61 − .28	44.71 − .14	62.32 − 2.48	8.28 − .48	13.17 − .08	19.09 + 2.64	26.99 − .12
24.3	3.95 .10	10.30 .32	44.56 .16	59.72 2.68	7.77 .51	13.08 .09	21.82 2.78	26.86 .15
34.2	3.84 − .11	9.98 − .34	44.40 − .17	56.97 − 2.80	7.25 − .54	12.99 − .10	24.66 + 2.83	26.70 − .17

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Piscium.	ν Piscium.	ζ Ceti.	γ Androm.	β Trianguli.	4 Urs. Min., S. P.	γ Trianguli.	67 Ceti.
	78° 25′	85° 4′	100° 52′	48° 12′	55° 32′	348° 4′	56° 39′	96° 55′
	h m	h m	h m	h m	h m	h m	h m	h m
	1 31	1 35	1 46	1 57	2 3	2 9	2 10	2 11
	s	s	s	s	s	s	s	s
(Dec.30.3)	18.51 − .11	44.90 − .09	4.32 − .12	11.87 − .16	2.88 − .14	14.73 +1.03	49.51 − .12	32.37 − .09
Jan. 9.3	18.39 .12	44.80 .11	4.20 .12	11.70 .18	2.74 .15	15.80 1.10	49.38 .14	32.27 .11
19.2	18.27 .12	44.68 .12	4.08 .13	11.52 .19	2.58 .16	16.93 1.15	49.22 .16	32.16 .12
29.2	18.15 .12	44.55 .12	3.95 .13	11.32 .20	2.41 .17	18.09 1.15	49.05 .17	32.02 .13
Feb. 8.2	18.03 .12	44.44 .11	3.82 .13	11.11 .19	2.23 .17	19.22 1.11	48.88 .18	31.89 .14
18.2	17.90 − .12	44.33 − .10	3.69 − .12	10.93 − .18	2.07 − .16	20.31 +1.04	48.71 − .17	31.75 − .13
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	21.74 + .14	48.08 + .14	7.32 + .16	15.34 + .20	6.18 + .19	12.69 − .55	52.72 + .20	35.20 + .18
Oct. 5.5	21.87 .11	48.21 .11	7.47 .13	15.53 .17	6.36 .17	12.21 .40	52.91 .18	35.37 .15
15.5	21.97 .08	48.31 .08	7.57 .09	15.69 .14	6.52 .14	11.88 .25	53.08 .15	35.49 .12
25.5	22.03 + .05	48.38 + .06	7.66 + .06	15.80 + .09	6.63 + .10	11.72 − .08	53.20 + .11	35.60 + .09
Nov. 4.5	22.06 + .02	48.42 + .03	7.70 + .03	15.87 .05	6.71 .06	11.73 + .10	53.29 .07	35.68 .06
14.4	22.08 .00	48.44 .00	7.72 .00	15.90 + .02	6.76 + .02	11.92 .29	53.35 + .04	35.71 + .03
24.4	22.05 − .03	48.42 − .03	7.71 − .02	15.91 − .02	6.76 − .02	12.32 .48	53.36 .00	35.73 .00
Dec. 4.4	22.01 .05	48.38 .05	7.68 .04	15.86 .06	6.73 .05	12.89 .64	53.35 − .03	35.71 − .03
14.3	21.95 − .07	48.32 − .07	7.62 − .07	15.78 − .10	6.67 − .07	13.61 + .80	53.30 − .07	35.67 − .06
24.3	21.87 .09	48.24 .09	7.54 .09	15.67 .14	6.59 .10	14.49 .95	53.21 .10	35.60 .08
34.3	21.77 − .11	48.14 − .11	7.44 − .11	15.52 − .17	6.46 − .14	15.51 +1.07	53.10 − .13	35.51 − .10

Mean Solar Date.	δ Hydri.	δ Ceti.	μ Hydri.	θ Persei.	σ Arietis.	47 Cephei.	ε Arietis.	β Persei. (*Algol.*)
	159° 9′	90° 9′	169° 35′	41° 14′	75° 22′	11° 1′	69° 6′	49° 28′
	h m	h m	h m	h m	h m	h m	h m	h m
	2 19	2 33	2 33	2 36	2 45	2 51	2 52	3 1
	s	s	s	s	s	s	s	s
(Dec.30.3)	50.36 − .52	53.44 − .09	63.91 −1.10	44.96 − .15	28.13 − .06	37.45 − .74	58.44 − .07	4.31 − .09
Jan. 9.3	49.83 .54	53.34 .10	62.77 1.17	44.79 .19	28.05 .10	36.66 .85	58.35 .10	4.20 .13
19.3	49.28 .56	53.23 .12	61.56 1.21	44.58 .22	27.93 .12	35.76 .95	58.23 .12	4.04 .17
29.2	48.71 .57	53.10 .13	60.34 1.22	44.35 .23	27.80 .13	34.75 1.02	58.10 .14	3.85 .19
Feb. 8.2	48.15 .55	52.96 .14	59.13 1.20	44.11 .24	27.66 .14	33.71 1.05	57.95 .15	3.65 .20
18.2	47.61 − .53	52.81 − .15	57.94 −1.17	43.86 − .25	27.51 − .15	32.65 −1.07	57.79 − .16	3.44 − .21
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Sept. 25.6	52.90 + .37	56.11 + .19	65.73 + .72	48.34 + .30	30.86 + .21	43.66 + .91	61.18 + .21	7.29 + .27
Oct. 5.6	53.23 .28	56.29 .17	66.36 .54	48.62 .25	31.06 .19	44.51 .79	61.38 .20	7.55 .25
15.5	53.46 .18	56.45 .14	66.80 .33	48.85 .20	31.24 .16	45.24 .64	61.58 .18	7.79 .22
25.5	53.58 + .07	56.57 + .11	67.02 + .11	49.03 + .16	31.38 + .13	45.79 + .49	61.75 + .15	7.99 + .18
Nov. 4.5	53.59 − .05	56.67 .08	67.01 − .12	49.17 .12	31.50 .10	46.18 .31	61.87 .11	8.15 .14
14.5	53.49 .15	56.74 .05	66.77 .34	49.27 .08	31.59 .07	46.40 + .13	61.97 .06	8.27 .10
24.4	53.29 .25	56.78 + .02	66.32 .55	49.32 + .03	31.65 .04	46.46 − .05	62.03 .05	8.36 .06
Dec. 4.4	53.00 .34	56.78 − .01	65.67 .74	49.32 − .02	31.66 + .01	46.31 .26	62.07 + .02	8.40 + .02
14.4	52.62 − .42	56.76 − .03	64.84 − .91	49.27 − .06	31.66 − .02	45.95 − .45	62.06 − .02	8.39 − .02
24.4	52.17 .48	56.72 .06	63.86 1.03	49.16 .12	31.62 .05	45.41 .62	62.03 .05	8.35 .07
34.3	51.67 − .53	56.64 − .09	62.77 −1.13	49.03 − .16	31.55 − .08	44.71 − .77	61.96 − .08	8.25 − .11

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Octantis. S. P.	ι Hydri.	*f* Tauri.	γ Camelop.	γ Hydri.	ε Persei.	A¹ Tauri.	*o* Persei.
	185° 54′	167° 47′	77° 26′	19° 0′	164° 34′	50° 18′	68° 13′	42° 35′
	h m 3 18	h m 3 18	h m 3 24	h m 3 38	h m 3 48	h m 3 50	h m 3 58	h m 4 0
	s	s	s	s	s	s	s	s
(Dec 30.4)	0.19 +2.16	46.23 − .85	51.13 − .06	52.11 − .27	60.32 − .61	32.29 − .06	15.06 − .03	45.01 − .06
Jan. 9.3	2.41 2.28	45.33 .95	51.06 .08	51.79 .37	59.67 .69	32.21 .10	15.01 .07	44.93 .11
19.3	4.76 2.41	44.34 1.03	50.97 .11	51.37 .46	58.94 .77	32.09 .14	14.93 .10	44.79 .16
29.3	7.23 2.47	43.28 1.07	50.84 .13	50.87 .53	58.13 .84	31.93 .17	14.81 .13	44.62 .19
Feb. 8.3	9.70 2.48	42.21 1.06	50.70 .14	50.32 .57	57.27 .88	31.75 .19	14.66 .16	44.40 .23
18.3	12.18 +2.43	41.13 −1.07	50.55 − .15	49.74 − .59	56.38 − .89	31.54 − .21	14.50 − .17	44.16 − .25
28.2	14.55 +2.31	40.07 −1.03	50.39 − .16	49.14 − .60	55.49 − .86	31.32 − .22	14.33 − .18	43.90 − .27
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 5.6	7.68 −1.08	46.30 + .65	53.76 + .23	56.54 + .61	59.50 + .61	35.16 + .32	17.58 + .26	47.99 + .34
15.6	6.75 .75	46.86 .47	53.98 .19	57.12 .55	60.05 .48	35.46 .27	17.83 .24	48.32 .32
25.5	6.18 − .37	47.24 + .28	54.15 + .16	57.63 + .46	60.47 + .35	35.71 + .23	18.06 + .21	48.62 + .29
Nov. 4.5	6.02 + .08	47.43 + .10	54.31 .14	58.04 .37	60.76 .21	35.93 .20	18.25 .19	48.89 .25
14.5	6.31 .50	47.43 − .09	54.44 .12	58.37 .27	60.89 + .06	36.12 .17	18.43 .16	49.11 .20
24.5	7.02 .91	47.24 .26	54.54 .08	58.58 .15	60.88 − .06	36.27 .13	18 57 .12	49.29 .15
Dec. 4.4	8.12 1.30	46.87 .46	54.59 .04	58.67 + .04	60.73 .22	36.38 .08	18.66 .09	49.41 .10
14.4	9.61 +1.66	46.33 − .63	54.62 + .01	58.66 − .07	60.43 − .30	36.43 + .03	18.73 + .05	49.49 + .05
24.4	11.43 1.97	45.62 .78	54.61 − .02	58.52 .19	59.96 .51	36.44 − .02	18.75 + .01	49.50 − .01
34.4	13.50 +2.19	44.78 − .90	54.57 − .06	58.27 − .29	59.40 − .62	36.40 − .07	18.74 − .04	49.46 − .07

Mean Solar Date.	*o*¹ Eridani.	η Urs. Min., S. P.	δ Mensæ.	*m* Persei.	τ Tauri.	ι Tauri.	ζ Aurigæ.	β Eridani.
	97° 7′	346° 0′	170° 28′	47° 10′	67° 15′	71° 21′	49° 5′	95° 14′
	h m 4 6	h m 4 20	h m 4 25	h m 4 25	h m 4 35	h m 4 44	h m 4 54	h m 5 2
	s	s	s	s	s	s	s	s
(Dec. 30.4)	32.85 − .04	37.80 + .48	30.39 − .88	44.92 − .03	42.26 .00	59.99 + .01	51.78 + .02	29.78 + .01
Jan. 9.4	32.80 .07	38.34 .62	29.42 1.06	44.87 .07	42.24 − .04	59.98 − .03	51.77 − .03	29.77 − .03
19.4	32.72 .10	39.04 .75	28.27 1.23	44.78 .11	42.18 .08	59.94 .07	51.72 .08	29.73 .07
29.3	32.61 .13	39.86 .85	26.97 1.35	44.64 .16	42.08 .12	59.85 .11	51.60 .13	29.64 .10
Feb. 8.3	32.46 .15	40.74 .92	25.58 1.42	44.46 .20	41.95 .15	59.72 .14	51.45 .18	29.52 .13
18.3	32.30 − .17	41.69 + .96	24.13 −1.47	41.24 − .23	41.79 − .16	59.57 − .16	51.25 − .21	29.38 − .15
28.3	32.14 .18	42.65 .95	22.65 1.47	44.02 .23	41.62 .17	59.41 .17	51.03 .22	29.21 .17
Mar. 10.2	31.97 − .17	43.59 + .93	21.19 −1.42	43.79 − .22	41.44 − .18	59.23 − .18	50.81 − .21	29.03 − .18
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 15.6	35.13 + .22	37.37 − .72	26.25 + .69	47.94 + .32	44.81 + .29	62.41 + .27	54.55 + .34	31.69 + .24
25.6	35.34 + .19	36.71 − .60	27.04 + .69	48.25 + .29	45.08 + .25	62.67 + .25	54.88 + .31	31.93 + .23
Nov. 4.6	35.52 .16	36.17 .46	27.62 .47	48.53 .26	45.31 .22	62.91 .23	55.18 .29	32.16 .21
14.5	35.68 .13	35.79 .31	27.98 + .24	48.77 .22	45.52 .19	63.13 .20	55.46 .26	32.36 .19
24.5	35.80 .10	35.55 − .15	28.09 − .02	48.98 .18	45.70 .16	63.31 .16	55.70 .21	32.55 .16
Dec. 4.5	35.89 .07	35.50 + .03	27.94 .28	49.13 .13	45.84 .12	63.45 .13	55.88 .16	32.69 .13
14.5	35.93 + .03	35.61 + .20	27.54 − .52	49.23 + .08	45.94 + .08	63.57 + .09	56.03 + .12	32.80 + .09
24.4	35.95 .00	35.91 .38	26.90 .75	49.29 + .03	46.00 + .03	63.64 + .05	56.12 + .06	32.87 + .05
34.4	35.92 − .04	36.37 + .54	26.04 − .97	49.28 − .03	46.01 − .02	63.66 .00	56.15 .00	32.89 .00

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Orionis.	χ Aurigæ.	Groombr. 944.	κ Orionis.	ν Aurigæ.	δ Doradus.	β Aurigæ.	θ Aurigæ.
	96° 58′ h m 5 12	57° 53′ h m 5 25	4° 52′ h m 5 27	99° 43′ h m 5 42	50° 53′ h m 5 43	155° 47′ h m 5 44	45° 4′ h m 5 51	52° 48′ h m 5 52
	s	s	s	s	s	s	s	s
(Dec.30.5)	19.18 + .02	38.35 + .05	16.07 − .20	35.62 + .04	56.44 + .08	38.08 − .13	32.49 + .09	17.72 + .08
Jan. 9.4	19.18 − .02	38.38 + .01	15.63 .67	35.65 .00	56.49 + .02	37.90 .22	32.55 + .03	17.78 + .03
19.4	19.15 .06	38.37 − .04	14.72 1.14	35.62 − .04	56.49 − .04	37.63 .31	32.55 − .03	17.78 − .02
29.4	19.07 .10	38.30 .09	13.35 1.57	35.57 .08	56.42 .09	37.27 .40	32.48 .09	17.73 .07
Feb. 8.3	18.96 .13	38.18 .14	11.58 1.92	35.46 .12	56.32 .13	36.84 .46	32.37 .15	17.64 .12
18.3	18.81 − .15	38.02 − .17	9.51 −2.18	35.32 − .15	56.16 − .18	36.35 − .51	32.19 − .20	17.49 − .17
28.3	18.64 .17	37.85 .19	7.22 2.35	35.17 .17	55.96 .21	35.82 .55	31.98 .22	17.31 .20
Mar. 10.3	18.46 .18	37.65 .20	4.82 2.41	34.99 .18	55.75 .22	35.25 .57	31.75 .24	17.10 .20
20.3	18.28 − .17	37.44 − .21	2.40 −2.40	34.81 − .17	55.53 − .21	34.68 − .55	31.50 − .25	16.90 − .18
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Oct. 25.6	21.25 + .24	41.07 + .31	26.33 +2.64	37.46 + .26	59.19 + .37	36.92 + .47	35.32 + .39	20.39 + .35
Nov. 4.6	21.48 .22	41.37 .28	28.81 2.31	37.71 .25	59.54 .33	37.36 .40	35.70 .36	20.73 .33
14.6	21.69 .20	41.64 .26	30.94 1.97	37.95 .23	59.85 .30	37.73 .32	36.05 .33	21.04 .30
24.5	21.88 .17	41.89 .23	32.75 1.60	38.17 .20	60.14 .27	38.01 .23	36.37 .29	21.33 .27
Dec. 4.5	22.04 .13	42.11 .19	34.12 1.14	38.34 .16	60.39 .23	38 20 .14	36.64 .25	21.59 .24
14.5	22.14 + .09	42.27 + .14	35.03 + .66	38.49 + .12	60.59 + .18	38.29 + .04	36.87 + .20	21.80 + .19
24.5	22.22 .05	42.39 .10	35.43 + .15	38.59 .08	60.73 .13	38.28 − .06	37.04 .14	21.95 .13
34.4	22.25 + .01	42.47 + .05	35.34 − .35	38.64 + .03	60.83 + .07	38.16 − .16	37.15 + .08	22.06 + .06

Mean Solar Date.	η Geminor.	ψ¹ Aurigæ.	ν Geminor.	χ Draconis, S. P.	ε Geminor.	ψ⁵ Aurigæ.	θ Geminor.	ζ Mensæ.
	67° 28′ h m 6 8	40° 39′ h m 6 16	69° 43′ h m 6 22	342° 41′ h m 6 22	64° 46′ h m 6 37	46° 19′ h m 6 38	55° 54′ h m 6 45	170° 42′ h m 6 49
	s	s	s	s	s	s	s	s
(Dec.30.5)	18.23 + .09	30.86 + .14	29.77 + .12	57.02 + .03	13.88 + .12	53.43 + .16	36.72 + .14	16.43 − .15
Jan. 9.5	18.30 + .05	30.97 + .06	29.86 + .06	57.11 .15	13.98 .08	53.56 .09	36.84 .10	16.15 .41
19.4	18.33 .00	30.99 − .01	29.89 .00	57.32 .29	14.04 + .03	53.61 + .02	36.92 + .04	15.61 .66
29.4	18.29 − .05	30.95 .08	29.88 − .04	57.69 .43	14.04 − .02	53.61 − .04	36.92 − .02	14.83 .88
Feb. 8.4	18.22 .09	30.84 .13	29.82 .08	58.17 .53	13.99 .07	53.54 .10	36.88 .07	13.65 1.08
18.4	18.11 − .13	30.69 − .18	29.72 − .12	58.74 + .62	13.89 − .12	53.42 − .15	36.78 − .12	12.68 −1.25
28.3	17.96 .16	30.47 .23	29.58 .15	59.42 .71	13.76 .15	53.25 .19	36.64 .16	11.36 1.38
Mar. 10.3	17.80 .18	30.22 .26	29.42 .17	60.16 .74	13.60 .17	53.05 .21	36.46 .19	9.93 1.48
20.3	17.61 .18	29.95 .27	29.24 .18	60.90 .76	13.42 .18	52.82 .23	36.27 .20	8.43 1.53
30.2	17.44 .17	29 68 .26	29.07 .17	61.67 .76	13.24 .18	52.58 .24	36.07 .21	6.88 1.54
Apr. 9.2	17.26 − .16	29.42 − .24	28.90 − .15	62.43 + .74	13.06 − .17	52.34 − .23	35.86 − .20	5.34 −1.50
. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 14.6	21.11 + .28	34.46 + .39	32.53 + .29	57.20 − .57	16.69 + .31	56.70 + .37	39.71 + .33	9.01 + .99
24.6	21.38 .25	34.83 .35	32.81 .26	56.68 .46	16.99 .28	57.06 .34	40.03 .31	9.88 .75
Dec. 4.6	21.62 .22	35.16 .30	33.06 .23	56.27 .34	17.26 .25	57.39 .30	40.33 .28	10.51 .52
14.5	21.81 + .18	35.43 + .24	33.27 + .19	55.99 − .21	17.49 + .21	57.67 + .26	40.59 + .24	10.93 + .28
24.5	21.97 .13	35.64 .18	33.44 .14	55.84 − .08	17.68 .17	57.91 .20	40.81 .19	11.08 + .01
34.5	22.08 + .08	35.79 + .12	33.56 + .09	55.84 + .07	17.83 + .12	58.03 + .14	40.98 + .13	10.95 − .27

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Geminor.	63 Aurigæ.	25 Camelop.	γ² Volantis.	β Can. Min.	26 Lyncis.	Groombr. 1374.	ω¹ Cancri.
	69° 16′	50° 30′	7° 23′	160° 19′	81° 29′	42° 9′	15° 48′	64° 19
	h m	h m	h m	h m	h m	h m	h m	h m
	6 57	7 4	7 8	7 9	7 21	7 46	7 47	7 54
	s	s	s	s	s	s	s	s
(Dec. 30.5)	39.01 + .14	9.96 + .19	14.30 + .70	44.12 + .06	14.73+ .14	47.09 + .26	10.94 + .54	20.49 + .21
Jan. 9.5	39.13 .10	10.12 .13	14.83 .36	44.11 − .07	14.86 .11	47.32 .19	11.39 .35	20.68 .16
19.5	39.21 + .05	10.21 + .06	15.01 + .01	43.97 .20	14.96 .07	47.47 .12	11.64 .17	20.82 .11
29.4	39.22 .00	10.24 .00	14.86 − .33	43.72 .32	14.99+ .01	47.57 + .05	11.75 + .02	20.90 + .05
Feb. 8.4	39.20 − .05	10.20 − .06	14.35 .66	43.34 .42	14.97− .04	47.58 − .02	11.69 − .14	20.92 .00
18.4	39.12 − .10	10.12 − .11	13.54 − .94	42.88 − .51	14.92− .08	47.52 − .09	11.46 − .30	20.89 − .05
28.4	38.99 .13	9.98 .16	12.47 1.18	42.32 .59	14.82 .12	47.40 .15	11.09 .43	20.82 .10
Mar. 10.3	38.86 .15	9.80 .19	11.19 1.37	41.69 .65	14.69 .14	47.23 .19	10.60 .54	20.71 .14
20.3	38.69 .17	9.60 .21	9.74 1.47	41.02 .68	14.54 .16	47.03 .22	10.01 .63	20.55 .16
30.3	38.52 .18	9.38 .21	8.25 1.52	40.33 .70	14.38 .17	46.79 .25	9.35 .67	20.39 .17
Apr. 9.2	38.34 − .17	9.17 − .20	6.71 −1.52	39.63 − .69	14.21− .16	46.54 − .24	8.67 − .68	20.22 − .16
19.2	38.17 − .15	8.98 − .17	5.22 −1.47	38.96 − .65	14.05− .14	46.30 − .21	7.99 − .67	20.06 − .14
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Nov. 24.6	41.94 + .30	13.35 + .34	23.81 +1.68	42.45 + .47	17.33+ .26	50.50 + .44	16.22 + .93	23.31 + .34
Dec. 4.6	42.22 .26	13.68 .31	25.39 1.48	42.87 .37	17.59 .25	50.92 .40	17.11 .84	23.64 .31
14.6	42.45 + .22	13.98 + .27	26.77 +1.22	43.19 + .28	17.84+ .23	51.30 + .35	17.91 + .73	23.94 + .28
24.5	42.66 .18	14.23 .22	27.83 .90	43.39 .14	18.06 .19	51.63 .30	18.57 .60	24.21 .25
34.5	42.82 + .13	14.43 + .17	28.57 + .56	43.46 + .01	18.22+ .13	51.91 + .24	19.11 + .47	24.44 + .20

Mean Solar Date.	ζ¹ Cancri.	β Cancri.	30 Monocerotis.	θ Chamæleontis.	σ Hydræ.	γ Cancri.	σ² Cancri. (*mean.*)	θ Hydræ.
	72° 1′	80° 29′	93° 33′	167° 8′	86° 17′	68° 8′	59° 0′	87° 14′
	h m	h m	h m	h m	h m	h m	h m	h m
	8 5	8 10	8 20	8 23	8 33	8 36	8 47	9 8
	s	s	s	s	s	s	s	s
(Dec. 30.6)	57.89 + .19	36.47 + .20	13.08 + .20	59.49 + .30	3.92+ .20	58.90 + .24	35.88 + .27	41.72 + .24
Jan. 9.5	58.07 .16	36.65 .16	13.26 .16	59.72 + .15	4.11 .18	59.12 .20	36.13 .22	41.95 .21
19.5	58.22 .12	36.80 .11	13.39 .11	59.80 − .01	4.28 .14	59.30 .15	36.33 .17	42.14 .16
29.5	58.31 .07	36.88 .06	13.48 .06	59.68 .20	4.38 .08	59.42 .10	36.47 .11	42.27 .11
Feb. 8.5	58.35 + .01	36.92 + .01	13.51 + .01	59.38 .38	4.44+ .03	59.49 + .04	36.55 .06	42.37 .06
18.4	58.33 − .04	36.90 − .04	13.50 − .03	58.92 − .54	4.44− .02	59.50 − .01	36.59 + .01	42.41 + .01
28.4	58.26 .08	36.84 .08	13.45 .07	58.28 .70	4.39 .06	59.47 .06	36.56 − .05	42.39 − .03
Mar. 10.4	58.16 .11	36.75 .11	13.35 .11	57.52 .81	4.32 .09	59.39 .10	36.48 .10	42.35 .07
20.4	58.03 .14	36.62 .13	13.23 .13	56.67 .90	4.21 .12	59.28 .13	36.37 .13	42.26 .10
30.3	57.88 .15	36.48 .14	13.09 .15	55.73 .97	4.08 .14	59.14 .15	36.22 .15	42.16 .12
Apr. 9.3	57.72 − .16	36.33 − .15	12.93 − .16	54.73 −1.01	3.93− .15	58.99 − .16	36.07 − .16	42.03 − .14
19.3	57.56 .15	36.17 .15	12.77 .15	53.71 1.03	3.78 .15	58.83 .15	35.90 .17	41.89 .14
29.2	57.41 .14	36.02 .14	12.63 .14	52.67 1.03	3.64 .14	58.68 .14	35.73 .16	41.76 .13
May 9.2	57.28 − .12	35.89 − .12	12.49 − .12	51.65 −1.01	3.50− .12	58.54 − .12	35.58 − .15	41.62 − .12

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Argus.	α Lyncis.	10 Leonis Minoris.	ο Leonis.	ζ Chamæleontis.	19 Leonis Minoris.	π Leonis.	λ Ursæ Majoris.
	159° 16′	55° 9′	53° 7′	79° 37′	170° 27′	48° 26′	81° 26′	46° 33′
	h m 9 11	h m 9 14	h m 9 27	h m 9 35	h m 9 37	h m 9 51	h m 9 54	h m 10 10
	s	s	s	s	s	s	s	s
(Dec. 30.6)	62.55 + .40	24.99 + .30	32.91 + .32	19.97 + .26	10.35 + .80	0.63 + .36	27.10 + .27	31.38 + .39
Jan. 9.6	62.89 .28	25.28 .25	33.21 .28	20.22 .23	11.06 .60	0.97 .32	27.36 .25	31.75 .35
19.6	63.11 .16	25.51 .20	33.48 .23	20.44 .20	11.56 .39	1.27 .27	27 60 .21	32.08 .30
29.5	63.22 + .05	25.70 .15	33.67 .17	20.61 .15	11.83 + .15	1.50 .20	27.78 .16	32.34 .24
Feb. 8.5	63.20 − .07	25.82 .09	33.81 .11	20.73 .10	11.86 − .09	1.67 .14	27.92 .11	32.55 .17
18.5	63.07 − .18	25.87 + .03	33.89 + .05	20.80 + .05	11.65 − .31	1.78 + .08	28.01 + .06	32.67 + .10
28.5	62.83 .29	25.88 − .02	33.91 − 01	20.82 .00	11.24 .52	1.83 + .02	28.05 + .02	32.75 + .04
Mar. 10.4	62.49 .38	25.83 .07	33.88 .06	20.80 − .05	10.60 .72	1.82 − .04	28.05 − .02	32.76 − .02
20.4	62.08 .45	25.74 .11	33.78 .11	20.73 .08	9.79 .80	1.75 .09	28.00 .06	32.71 .08
30.4	61.60 .51	25.60 .14	33.66 .14	20.64 .10	8.84 1.02	1.63 .13	27.93 .09	32.61 .12
Apr. 9.3	61.07 − .55	25.45 − .16	33.51 − .16	20.53 − .12	7.74 −1.15	1.49 − .16	27.83 − .11	32.48 − .15
19.3	60.51 .57	25.28 .17	33.35 .17	20.40 .13	6.55 1.23	1.32 .18	27.71 .12	32.32 .18
29.3	59.93 .58	25.10 .17	33.17 .17	20.27 .13	5.29 1.28	1.14 .18	27.59 .12	32.13 .19
May 9.3	59.34 .58	24.93 .16	33.00 .16	20.14 .12	3.99 1.32	0.96 .18	27.47 .12	31.94 .18
19.2	58.76 − .57	24.78 − .14	32.84 − .15	20.02 − .11	2.66 −1.34	0.78 − .17	27.34 − .12	31.76 − .16

Mean Solar Date.	μ Hydræ.	β Leonis Minoris.	α Antliæ.	β Octantis, S. P.	41 Leonis Minoris.	δ^3 Chamæleontis.	46 Leonis Minoris.	Groombr. 1706.
	106° 17′	52° 44′	120° 31′	188° 3′	66° 14′	169° 58′	55° 12′	11° 39′
	h m 10 20	h m 10 21	h m 10 22	h m 10 34	h m 10 37	h m 10 44	h m 10 47	h m 10 51
	s	s	s	s	s	s	s	s
Jan. 19.6	49.50 + .24	35.40 + .29	10.27 + .22	45.25 − .61	29.71 + .24	50.01 + .75	13.39 + .30	17.58 + .98
29.6	49.71 .18	35.66 .23	10.47 .17	44.74 .40	29.94 .21	50.66 .55	13.67 .25	18.47 .80
Feb. 8.6	49.86 .12	35.86 .16	10.62 .12	44.46 − .16	30.14 .17	51.11 .34	13.88 .19	19.18 .61
18.5	49.96 .07	35.99 .11	10.72 .08	44.43 + .08	30.28 .12	51.34 + .13	14.05 .14	19.69 .41
28.5	50.01 + .03	36.08 + .06	10.78 + .03	44.62 .31	30.38 .07	51.37 − .07	14.17 .08	19.99 + .19
Mar. 10.5	50.02 − .01	36.11 .00	10.77 − .02	45.05 + .56	30.41 + .02	51.20 − .27	14.22 + .03	20.07 − .02
20.4	50.00 .05	36.08 − .05	10.73 .06	45.74 .79	30.41 − .03	50.84 .46	14.22 − .02	19.95 .22
30.4	49.93 .08	36.00 .09	10.65 .10	46.62 .98	30.36 .06	50.29 .64	14.18 .06	19.63 .41
Apr. 9.4	49.84 .10	35.89 .12	10.54 .12	47.71 1.17	30.29 .08	49.58 .77	14.10 .09	19.13 .57
19.4	49.73 .11	35.76 .14	10.41 .14	48.96 1.34	30.20 .10	48.75 .89	14.00 .12	18.49 .70
29.3	49.62 − .12	35.61 − .16	10.26 − .15	50.38 +1.48	30.08 − .12	47.80 −1.00	13.86 − .14	17.74 − .79
May 9.3	49.49 .13	35.44 .17	10.11 .15	51.92 1.59	29.95 .13	46.74 1.08	13.72 .14	16.91 .86
19.3	49.36 .13	35.28 .16	9.96 .15	53.55 1.67	29.83 .13	45.64 1.13	13.58 .15	16.03 .89
29.3	49.24 .12	35.13 .14	9.81 .14	55.25 1.70	29.70 .12	44.49 1.17	13.43 .14	15.14 .88
June 8.2	49.12 − .11	34.99 − .12	9.67 − .13	56.95 +1.67	29.59 − .10	43.30 −1.20	13.29 − .13	14.27 − .84

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Octantis. 174° 0′ h m 10 59	p³ Leonis. 87° 27′ h m 11 1	ψ Urs. Maj. 44° 55′ h m 11 3	ν Urs. Maj. 56° 19′ h m 11 12	ξ Hydræ. 121° 15′ h m 11 27	χ Urs. Maj. 41° 37′ h m 11 40	π Virginis. 82° 47′ h m 11 55	ε Corvi. 112° 1′ h m 12 4
	s	s	s	s	s	s	s	s
Feb. 8.6	73.87 + .65	21.11 + .15	33.25 + .24	36.40 + .21	39.00 + .20	18.86 + .30	17.65 + .21	31.47 + .23
18.6	74.36 + .33	21.25 .12	33.46 .18	36.68 .17	39.18 .15	19.13 .23	17.85 .18	31.68 .19
28.5	74.52 .00	21.36 .08	33.60 .11	36.82 .12	39.31 .10	19.32 .16	18.02 .14	31.85 .15
Mar. 10.5	74.36 – .33	21.42 + .04	33.68 + .05	36.91 + .08	39.39 .06	19.45 .10	18.13 .10	31.98 .11
20.5	73.87 .64	21.44 .00	33.70 – .01	36.94 .00	39.42 + .01	19.52 + .04	18.20 .06	32.06 .07
30.4	73.08 – .93	21.42 – .03	33.66 – .06	36.92 – .04	39.42 – .02	19.53 – .02	18.25 + .02	32.10 + .03
Apr. 9.4	72.01 1.19	21.38 .06	33.58 .10	36.87 .07	39.38 .05	19.48 .07	18.25 – .01	32.11 .00
19.4	70.70 1.42	21.30 .08	33.47 .13	36.79 .10	39.31 .08	19.39 .11	18.22 .04	32.09 – .03
29.4	69.17 1.62	21.22 .09	33.32 .16	36.68 .12	39.22 .10	19.26 .14	18.17 .06	32.05 .05
May 9.3	67.46 1.78	21.12 .10	33.15 .18	36.55 .13	39.11 .12	19.10 .17	18.10 .07	31.98 .07
19.3	65.61 –1.90	21.02 – .11	32.97 – .19	36.41 – .14	38.98 – .13	18.92 – .18	18.03 – .08	31.90 – .09
29.3	63.66 1.98	20.91 .11	32.77 .19	36.28 .15	38.85 .14	18.74 .19	17.94 .09	31.81 .10
June 8.3	61.65 2.00	20.80 .10	32.59 .18	36.12 .14	38.71 .14	18.53 .20	17.84 .10	31.70 .11
18.2	59.67 –1.93	20.71 – .06	32.42 – .16	35.99 – .12	38.57 – .13	18.34 – .19	17.74 – .10	31.59 – .10

Mean Solar Date.	2 Can. Ven. 48° 44′ h m 12 10	6 Urs. Min. 1° 42′ h m 12 14	δ² Corvi. 105° 55′ h m 12 24	β Can. Ven. 48° 3′ h m 12 28	γ Virginis, (*mean.*) 90° 51′ h m 12 36	31 Comæ Berenices. 61° 52′ h m 12 46	γ Cassiop., S. P. 330° 8′ h m 12 50	43 Cephei, S. P. 355° 40′ h m 12 53
	s	s	s	s	s	s	s	s
Feb. 8.6	40.70 + .28	58.19 +5.75	13.85 + .24	34.75 + .31	8.49 + .24	23.89 + .29	5.33 – .32	41.62 –2.45
18.6	40.96 .24	63.44 4.65	14.07 .20	35.04 .26	8.72 .21	24.16 .25	5.04 .25	39.37 2.05
28.6	41.18 .19	67.50 3.41	14.25 .16	35.28 .21	8.90 .17	24.39 .20	4.84 .18	37.53 1.63
Mar. 10.5	41.34 .13	70.27 2.06	14.39 .13	35.46 .15	9.06 .13	24.57 .16	4.69 .11	36.12 1.16
20.5	41.44 .08	71.63 + .66	14.51 .09	35.58 .10	9.17 .10	24.71 .11	4.61 – .04	35.21 .64
30.5	41.49 + .03	71.58 – .73	14.57 + .05	35.66 + .05	9.26 + .07	24.79 + .07	4.60 + .04	34.85 – .08
Apr. 9.5	41.50 – .02	70.17 2.05	14.60 + .02	35.68 .00	9.30 + .03	24.85 + .03	4.70 .13	35.06 + .46
19.4	41.46 .06	67.47 3.28	14.60 – .01	35.66 – .04	9.31 .00	24.86 – .01	4.87 .21	35.78 .97
29.4	41.39 .09	63.60 4.35	14.59 .03	35.60 .08	9.30 – .02	24.84 .04	5.11 .29	37.01 1.46
May 9.4	41.28 .12	58.76 5.25	14.54 .06	35.51 .11	9.27 .04	24.79 .06	5.45 .36	38.71 1.88
19.4	41.15 – .14	53.09 –5.97	14.47 – .07	35.38 – .14	9.22 – .06	24.73 – .08	5.84 + .42	40.77 +2.23
29.3	41.00 .15	46.81 6.47	14.40 .08	35.24 .15	9.15 .07	24.63 .10	6.28 .46	43.18 2.51
June 8.3	40.84 .16	40.15 6.76	14.31 .09	35.09 .16	9.07 .08	24.53 .11	6.76 .51	45.80 2.71
18.3	40.68 – .15	33.29 –6.88	14.21 – .10	34.92 – .16	8.98 – .08	24.42 – .10	7.30 + .56	48.60 +2.84

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Muscæ.	ε Virginis.	20 Can. Ven.	κ Octantis.	B.A.C. 4536.	**m** Virginis.	θ Apodis.	π Hydræ.
	160° 58′	78° 27′	48° 51′	175° 14′	52° 16′	98° 9′	166° 16′	116° 9′
	h m 12 54	h m 12 56	h m 13 12	h m 13 23	h m 13 29	h m 13 35	h m 13 54	h m 14 0
	s	s	s	s	s	s	s	s
Mar. 0.6	49.91 + .42	45.77 + .20	40.42 + .25	31.72 +1.82	56.71 + .26	53.90 + .21	45.29 + .81	10.14 + .24
10.6	49.59 .33	45.95 .16	40.65 .21	33.37 1.47	56.95 .22	54.10 .19	46.04 .68	10.37 .22
20.6	49.87 .24	46.09 .12	40.84 .15	34.66 1.10	57.14 .17	54.27 .16	46.66 .55	10.59 .20
30.5	50.06 .14	46.19 .08	40.95 .10	35.57 .71	57.28 .12	54.42 .13	47.15 .43	10.76 .16
Apr. 9.5	50.14 + .04	46.25 .05	41.04 .06	36.08 + .33	57.39 .08	54.53 .09	47.52 .30	10.90 .13
19.5	50.13 − .05	46.29 + .02	41.07 + .01	36.23 − .04	57.44 + .03	54.60 + .06	47.76 + .17	11.01 + .10
29.4	50.03 .14	46.29 − .01	41.07 − .03	35.99 .44	57.45 − .01	54.65 .03	47.87 + .04	11.09 .07
May 9.4	49.85 .23	46.27 .03	41.01 .07	35.35 .82	57.43 .04	54.67 + .01	47.84 − .09	11.14 .04
19.4	49.58 .30	46.22 .05	40.93 .09	34.35 1.16	57.38 .07	54.66 − .02	47.69 .22	11.16 + .01
29.4	49.26 .36	46.16 .07	40.83 .12	33.03 1.47	57.30 .10	54.64 .04	47.41 .34	11.15 − .02
June 8.3	48.86 − .42	46.08 − .08	40.70 − .14	31.42 −1.77	57.18 − .12	54.59 − .06	47.02 − .45	11.12 − .05
18.3	48.40 .46	46.00 .09	40.54 .16	29.50 2.01	57.06 .13	54.53 .07	46.51 .55	11.05 .07
28.3	47.89 .50	45.89 .10	40.38 .17	27.41 2.18	56.92 .15	54.45 .09	45.92 .64	10.98 .09
July 8.3	47.40 − .47	45.79 − .10	40.21 − .16	25.14 −2.34	56.76 − .16	54.35 − .10	45.24 − .72	10.87 − .11

Mean Solar Date.	**d** Bootis.	κ Virginis.	4 Urs. Min.	δ Octantis.	λ Bootis.	λ Virginis.	μ Hydri, S. P.	α Apodis.
	64° 24′	99° 46′	11° 56′	173° 10′	43° 25′	102° 52′	190° 25′	168° 35′
	h m 14 5	h m 14 7	h m 14 9	h m 14 9	h m 14 12	h m 14 13	h m 14 33	h m 14 34
	s	s	s	s	s	s	s	s
Mar. 20.6	26.74 + .20	5.61 + .20	22.90 + .62	36.52 +1.18	15.93 + .22	13.41 + .19	54.94 − .81	24.16 + .84
30.6	26.92 .16	5.79 .16	23.43 .43	37.58 .94	16.13 .18	13.59 .16	54.21 .64	24.93 .70
Apr. 9.5	27.04 .12	5.93 .12	23.77 .24	38.40 .67	16.29 .13	13.73 .13	53.65 .47	25.56 .56
19.5	27.14 .08	6.03 .09	23.92 + .06	38.93 .40	16.40 .06	13.85 .10	53.27 .29	26.05 .41
29.5	27.21 .05	6.12 .06	23.80 − .12	39.21 + .13	16.46 + .03	13.94 .07	53.08 − .10	26.38 .25
May 9.5	27.24 + .01	6.18 + .04	23.67 − .30	39.20 − .13	16.46 − .02	14.00 + .04	53.08 + .10	26.54 + .09
19.4	27.24 − .02	6.20 + .02	23.29 .46	38.93 .40	16.42 .06	14.02 + .02	53.29 .30	26.55 − .07
29.4	27.21 .05	6.20 − .01	22.76 .60	38.40 .66	16.35 .09	14.04 .00	53.68 .48	26.39 .24
June 8.4	27.15 .07	6.17 .04	22.09 .72	37.60 .91	16.24 .13	14.01 − .03	54.25 .66	26.07 .39
18.3	27.08 .08	6.13 .06	21.32 .81	36.58 1.12	16.09 .16	13.97 .05	55.01 .83	25.61 .54
28.3	26.99 − .10	6.06 − .08	20.47 − .88	35.36 −1.30	15.92 − .18	13.91 − .07	55.90 + .96	25.00 − .67
July 8.3	26.87 .12	5.98 .10	19.55 .94	33.98 1.45	15.73 .20	13.82 .09	56.92 1.06	24.27 .78
18.3	26.74 .13	5.87 .11	18.59 .97	32.45 1.59	15.52 .21	13.72 .11	58.05 1.16	23.45 .86
28.2	26.60 − .14	5.75 − .12	17.61 − .98	30.80 −1.70	15.30 − .22	13.60 − .12	59.23 +1.19	22.55 − .92

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Bootis.	47 Cephei, S. P.	γ Scorpii.	δ Bootis.	ρ Octantis.	β Cor. Bor.	γ Camelop., S. P.	δ¹ Apodis.
	45° 8′	348° 59′	114° 51′	56° 17′	174° 6′	60° 31′	341° 0′	168° 25′
	h m 14 34	h m 14 51	h m 14 57	h m 15 11	h m 15 18	h m 15 23	h m 15 38	h m 16 4
	s	s	s	s	s	s	s	s
Mar. 30.6	48.44 + .21	29.35 − .52	42.21 + .21	7.69 + .23	20.82 +1.73	21.14 + .22	47.64 − .42	7.24 +1.11
Apr. 9.6	48.63 .16	28.93 .32	42.41 .18	7.90 .19	22.41 1.45	21.35 .19	47.29 .28	8.28 .98
19.5	48.76 .11	28.71 − .11	42.58 .16	8.06 .15	23.72 1.16	21.53 .16	47.08 .15	9.19 .84
29.5	48.84 .06	28.71 + .11	42.73 .13	8.19 .11	24.74 .85	21.67 .12	46.99 − .03	9.96 .69
May 9.5	48.89 + .02	28.93 .33	42.84 .10	8.28 .08	25.42 .53	21.78 .09	47.03 + .10	10.57 .54
19.5	48.89 − .03	29.38 + .54	42.92 + .07	8.34 + .04	25.80 + .20	21.85 + .05	47.19 + .23	11.04 + .38
29.4	48.84 .07	30.02 .72	42.97 + .04	8.36 .00	25.82 − .14	21.89 + .02	47.49 .35	11.33 .21
June 8.4	48.75 .10	30.83 .88	42.99 .00	8.34 − .04	25.53 .47	21.88 − .02	47.90 .47	11.45 + .03
18.4	48.64 .13	31.77 1.02	42.97 − .03	8.29 .07	24.88 .79	21.85 .05	48.43 .57	11.39 − .15
28.3	48.50 .16	32.88 1.14	42.93 .06	8.20 .10	23.96 1.07	21.78 .08	49.04 .65	11.15 .32
July 8.3	48.31 − .19	34.06 +1.22	42.86 − .09	8.09 − .13	22.73 −1.35	21.69 − .11	49.73 + .72	10.76 − .47
18.3	48.11 .21	35.31 1.27	42.76 .11	7.95 .15	21.27 1.58	21.56 .14	50.48 .77	10.21 .61
28.3	47.90 .22	36.59 1.29	42.64 .13	7.79 .17	19.57 1.76	21.42 .16	51.26 .80	9.50 .74
Aug. 7.2	47.66 .23	37.89 1.29	42.50 .15	7.61 .19	17.75 1.85	21.25 .18	52.07 .81	8.70 .84
17.2	47.43 .22	39.17 1.26	42.35 .16	7.41 .20	15.86 1.89	21.07 .19	52.88 .81	7.82 .91
27.2	47.21 − .21	40.41 +1.20	42.18 − .17	7.22 − .18	13.96 −1.87	20.88 − .19	53.69 + .80	6.89 − .94

Mean Solar Date.	φ Herculis.	σ Cor. Bor. (mean.)	γ Apodis.	η Urs. Min.	η Ophiuchi.	π Herculis.	θ Ophiuchi.	δ Aræ.
	44° 47′	55° 52′	168° 39′	14° 0′	105° 35′	53° 4′	114° 53′	150° 36′
	h m 16 5	h m 16 10	h m 16 16	h m 16 20	h m 17 4	h m 17 11	h m 17 15	h m 17 21
	s	s	s	s	s	s	s	s
Apr. 9.6	21.33 + .24	36.85 + .23	48.93 +1.03	46.03 + .63	8.14 + .28	15.87 + .29	19.43 + .31	16.66 + .54
19.6	21.56 .21	37.07 .20	49.90 .91	46.60 .50	8.41 .26	16.15 .27	19.73 .28	17.18 .50
29.6	21.76 .18	37.26 .17	50.75 .76	47.04 .37	8.65 .24	16.41 .24	19.99 .25	17.66 .46
May 9.6	21.91 .14	37.41 .14	51.42 .60	47.34 .22	8.88 .21	16.62 .20	20.24 .23	18.09 .41
19.5	22.03 .09	37.54 .10	51.96 .45	47.48 + .06	9.07 .18	16.80 .16	20.46 .20	18.47 .36
29.5	22.08 + .04	37.61 + .06	52.32 + .27	47.47 − .09	9.24 + .15	16.95 + .12	20.65 + .17	18.80 + .29
June 8.5	22.10 − .01	37.65 + .02	52.50 + .09	47.31 .24	9.38 .12	17.04 .08	20.81 .14	19.04 .22
18.4	22.06 .06	37.65 − .02	52.50 − .09	46.99 .38	9.49 .08	17.10 + .04	20.93 .10	19.23 .15
28.4	21.98 .11	37.61 .06	52.32 .27	46.54 .51	9.55 + .04	17.12 − .01	21.00 .06	19.34 + .07
July 8.4	21.85 .15	37.53 .10	51.96 .44	45.96 .64	9.57 .00	17.08 .06	21.05 + .02	19.36 − .01
18.4	21.69 − .18	37.42 − .13	51.44 − .60	45.26 − .74	9.56 − .03	17.00 − .10	21.04 − .03	19.32 − .08
28.3	21.49 .21	37.27 .16	50.76 .73	44.48 .82	9.51 .07	16.88 .14	20.99 .07	19.20 .16
Aug. 7.3	21.27 .23	37.10 .19	49.98 .84	43.63 .88	9.42 .10	16.72 .17	20.91 .10	19.00 .22
17.3	21.02 .26	36.90 .21	49.08 .92	42.72 .93	9.31 .13	16.53 .20	20.78 .13	18.75 .28
27.3	20.75 .27	36.69 .22	48.13 .96	41.78 .95	9.16 .15	16.31 .22	20.64 .15	18.44 .33
Sept. 6.2	20.48 − .27	36.47 − .22	47.16 − .96	40.82 − .95	9.01 − .16	16.08 − .23	20.48 − .17	18.09 − .35
16.2	20.22 .26	36.26 .22	46.20 .93	39.88 .91	8.84 .17	15.84 .24	20.29 .18	17.74 .36
26.2	19.96 .24	36.04 .22	45.30 .85	39.00 .85	8.67 .16	15.60 .23	20.12 .17	17.38 .35
Oct. 6.1	19.75 − .19	35.81 − .22	44.50 − .74	38.18 − .78	8.53 − .14	15.37 − .22	19.96 − .15	17.04 − .33

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombr. 944,S.P. 355° 8′ h m 17 26	ι Herculis. 43° 56′ h m 17 36	θ Herculis. 52° 44′ h m 17 52	ο Herculis. 61° 15′ h m 18 3	λ Sagittarii. 115° 29′ h m 18 21	χ Draconis. 17° 19′ h m 18 22	ζ Pavonis. 161° 31′ h m 18 30	γ Lyræ. 57° 28′ h m 18 54
	s	s	s	s	s	s	s	s
May 19.6	52.78 − .46	25.28 + .19	32.47 + .19	18.89 + .21	16.05 + .26	64.84 + .43	21.56 + .64	53.24 + .25
29.6	52.55 .00	25.45 .15	32.65 .16	19.09 .18	16.30 .24	65.21 .31	22.17 .58	53.48 .22
June 8.5	52.78 + .46	25.58 .10	32.80 .12	19.25 .14	16.53 .21	65.46 .19	22.72 .49	53.69 .19
18.5	53.48 .92	25.65 + .05	32.90 .08	19.36 .10	16.71 .17	65.58 + .06	23.14 .37	53.86 .15
28.5	54.61 1.34	25.67 .00	32.95 + .03	19.45 .06	16.86 .13	65.58 − .07	23.46 .26	53.99 .11
July 8.5	56.16 +1.74	25.64 − .06	32.97 − .02	19.48 + .01	16.97 + .08	65.45 − .19	23.65 + .13	54.07 + .06
18.4	58.09 2.07	25.55 .11	32.92 .06	19.47 − .03	17.02 + .03	65.19 .31	23.72 .00	54.11 + .01
28.4	60.30 2.37	25.41 .16	32.84 .11	19.42 .08	17.03 − .02	64.83 .42	23.66 − .12	54.09 − .04
Aug. 7.4	62.83 2.63	25.23 .20	32.71 .15	19.32 .12	17.00 .06	64.34 .52	23.49 .23	54.04 .08
17.3	65.57 2.82	25.01 .24	32.54 .19	19.18 .15	16.92 .10	63.78 .62	23.20 .34	53.93 .13
27.3	68.47 +2.96	24.75 − .27	32.34 − .21	19.02 − .18	16.81 − .14	63.11 − .70	22.80 − .44	53.78 − .16
Sept. 6.3	71.50 3.06	24.48 .29	32.12 .23	18.83 .20	16.65 .16	62.39 .75	22.33 .51	53.61 .19
16.3	74.59 3.08	24.18 .30	31.87 .25	18.62 .21	16.49 .18	61.62 .78	21.78 .56	53.40 .21
26.2	77.67 3.05	23.88 .29	31.62 .25	18.41 .22	16.30 .18	60.83 .80	21.21 .58	53.18 .22
Oct. 6.2	80.69 2.98	23.60 .27	31.38 .24	18.19 .21	16.13 .18	60.02 .80	20.62 .58	52.96 .22
16.2	83.63 +2.88	23.33 − .25	31.14 − .23	17.99 − .19	15.95 − .17	59.23 − .78	20.05 − .56	52.73 − .22

Mean Solar Date.	ι Lyræ. 54° 4′ h m 19 3	25 Camelop. S. P. 352° 27′ h m 19 8	θ Lyræ. 52° 4′ h m 19 12	β Cygni. 62° 16′ h m 19 26	β Sagittæ. 72° 47′ h m 19 36	δ Cygni. 45° 8′ h m 19 41	Groombr. 1374,S.P. 344° 12′ h m 19 47	ε Pavonis. 163° 12′ h m 19 48
	s	s	s	s	s	s	s	s
May 29.6	26.26 + .24	0.85 − .60	36.50 + .25	20.84 + .24	10.42 + .26	35.52 + .29	5.88 − .35	2.47 + .81
June 8.6	26.48 .20	0.37 .36	36.73 .21	21.07 .22	10.67 .23	35.79 .25	5.59 .23	3.23 .71
18.6	26.66 .16	0.17 − .06	36.92 .17	21.28 .19	10.88 .20	36.02 .20	5.42 − .11	3.89 .61
28.5	26.80 .11	0.26 + .23	37.06 .12	21.45 .14	11.06 .16	36.20 .15	5.37 + .02	4.45 .50
July 8.5	26.89 .06	0.63 .52	37.16 .07	21.56 .09	11.20 .12	36.32 .10	5.47 .16	4.89 .38
18.5	26.92 + .01	1.29 + .80	37.20 + .02	21.64 + .05	11.29 + .07	36.40 + .04	5.69 + .28	5.21 + .25
28.4	26.91 − .03	2.22 1.04	37.20 − .03	21.66 + .01	11.34 + .03	36.40 − .02	6.03 .41	5.38 + .10
Aug. 7.4	26.86 .08	3.37 1.26	37.14 .08	21.65 − .04	11.35 − .01	36.36 .07	6.51 .52	5.41 − .04
17.4	26.75 .13	4.74 1.47	37.03 .13	21.58 .09	11.31 .06	36.26 .12	7.07 .63	5.29 .18
27.4	26.60 .17	6.31 1.67	36.89 .17	21.47 .13	11.23 .10	36.12 .17	7.75 .72	5.05 .30
Sept. 6.3	26.41 − .20	8.08 +1.83	36.70 − .20	21.32 − .16	11.12 − .13	35.92 − .21	8.52 + .81	4.69 − .42
16.3	26.20 .22	9.96 1.94	36.48 .22	21.16 .18	10.97 .15	35.69 .24	9.36 .88	4.21 .52
26.3	25.97 .23	11.95 2.03	36.24 .24	20.96 .20	10.81 .17	35.45 .26	10.27 .94	3.65 .59
Oct. 6.3	25.73 .24	14.01 2.06	35.99 .25	20.75 .21	10.63 .18	35.17 .28	11.24 .98	3.03 .63
16.2	25.49 .24	16.11 2.08	35.75 .24	20.55 .20	10.45 .18	34.89 .28	12.24 1.00	2.39 .63
26.2	25.25 − .23	18.16 +2.04	35.51 − .23	20.35 − .19	10.27 − .17	34.61 − .28	13.24 +1.01	1.76 − .62
Nov. 5.2	25.05 − .19	20.20 +2.00	35.29 − .21	20.16 − .18	10.11 − .15	34.33 − .27	14.26 +1.01	1.15 − .59

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.	o Sagittarii.	θ Aquilæ.	31 Cygni.	α Delphini.	β Pavonis.	ψ Capricor.	ε Cygni.
	70° 48′ h m 19 53	118° 1′ h m 19 55	91° 9′ h m 20 5	43° 35′ h m 20 10	74° 28′ h m 20 34	156° 36′ h m 20 35	115° 40′ h m 20 39	56° 26′ h m 20 41
	s	s	s	s	s	s	s	s
June 18.6	56.21 + .20	59.32 + .26	42.45 + .21	13.77 + .23	35.98 + .23	11.71 + .54	40.25 + .29	49.56 + .26
28.6	56.40 .17	59.57 .22	42.65 .19	13.98 .19	36.20 .21	12.22 .47	40.52 .25	49.80 .22
July 8.5	56.56 .13	59.76 .18	42.84 .16	14.15 .14	36.40 .18	12.66 .40	40.75 .21	50.00 .17
18.5	56.67 .09	59.92 .14	42.97 .11	14.26 .08	36.55 .13	13.01 .30	40.95 .17	50.15 .12
28.5	56.73 + .05	60.03 .09	43.06 .07	14.30 + .02	36.65 .08	13.27 .20	41.10 .12	50.25 .07
Aug. 7.5	56.76 .00	60.08 + .03	43.11 + .02	14.30 − .04	36.72 + .04	13.41 + .09	41.19 + .07	50.30 + .03
17.4	56.73 − .05	60.08 − .02	43.11 − .02	14.23 .10	36.74 .00	13.45 − .01	41.24 + .02	50.31 − .02
27.4	56.66 .09	60.04 .06	43.08 .06	14.11 .15	36.72 − .04	13.39 .11	41.24 − .02	50.27 .07
Sept. 6.4	56.55 .12	59.95 .10	43.00 .09	13.94 .19	36.65 .08	13.23 .21	41.20 .06	50.18 .11
16.4	56.42 .15	59.83 .13	42.90 .12	13.73 .23	36.55 .12	12.97 .29	41.11 .10	50.05 .15
26.3	56.26 − .17	59.68 − .16	42.76 − .14	13.48 − .26	36.42 − .14	12.65 − .35	40.99 − .13	49.88 − .17
Oct. 6.3	56.08 .18	59.51 18	42.62 .15	13.21 .27	36.27 .15	12.26 .41	40.85 .15	49.70 .19
16.3	55.91 .18	59.33 .18	42.46 .16	12.93 .28	36.11 .16	11.83 .43	40.69 .16	49.50 .20
26.2	55.72 .18	59.16 .17	42.30 .16	12.65 .28	35.94 .16	11.39 .44	40.53 .16	49.30 .21
Nov. 5.2	55.55 .16	59.00 .15	42.15 .14	12.37 .27	35.78 .15	10.95 .43	40.37 .15	49.09 .20
15.2	55.41 − .13	58.86 − .12	42.03 − .11	12.11 − .25	35.64 − .14	10.53 − .40	40.22 − .14	48.90 − .18
25.2	55.30 − .10	58.75 − .09	41.94 − .08	11.87 − .23	35.50 − .13	10.16 − .36	40.09 − .12	48.72 − .16

Mean Solar Date.	τ Cygni.	ζ Capricor.	74 Cygni.	λ¹ Octantis.	ζ Chamæleontis, S.P.	π² Cygni.	16 Pegasi.	π Pegasi.
	52° 25′ h m 21 10	112° 53′ h m 21 20	50° 5′ h m 21 32	173° 13′ h m 21 34	189° 33′ h m 21 36	41° 12′ h m 21 42	64° 35′ h m 21 48	57° 21′ h m 22 5
	s	s	s	s	s	s	s	s
July 8.6	28.27 + .21	28.73 + .25	36.58 + .23	21.01 +1.44	56.87 − .84	47.82 + .26	7.79 + .24	10.39 + .26
18.6	28.46 .16	28.96 .21	36.79 .19	22.33 1.19	56.11 .68	48.06 .21	8.01 .20	10.63 .22
28.5	28.59 .11	29.15 .16	36.95 .14	23.38 .89	55.51 .49	48.24 .16	8.18 .15	10.82 .17
Aug. 7.5	28.68 .06	29.28 .11	37.07 .09	24.11 .57	55.14 .27	48.37 .10	8.31 .11	10.97 .12
17.5	28.71 + .01	29.37 .06	37.12 + .03	24.51 + .24	54.97 − .07	48.43 + .03	8.41 .07	11.07 .08
27.5	28.69 − .04	29.41 + .01	37.13 − .02	24.59 − .09	55.01 + .18	48.43 − .03	8.45 + .02	11.13 + .03
Sept. 6.4	28.62 .09	29.40 − .03	37.09 .07	24.33 .44	55.32 .44	48.38 .08	8.44 − .03	11.13 − .01
16.4	28.51 .13	29.36 .07	37.00 .11	23.71 .76	55.86 .64	48.28 .13	8.39 .06	11.11 .05
26.4	28.37 .16	29.27 .10	36.87 .15	22.81 1.04	56.58 .82	48.12 .18	8.32 .09	11.03 .09
Oct. 6.4	28.19 .19	29.15 .12	36.70 .18	21.64 1.28	57.51 1.02	47.92 .21	8.20 .12	10.92 .12
16.3	27.99 − .20	29.02 − .14	36.51 − .20	20.25 −1.47	58.62 +1.17	47.70 − .23	8.07 − .14	10.78 − .15
26.3	27.78 .21	28.87 .15	36.30 .21	18.71 1.60	59.85 1.27	47.46 .25	7.92 .15	10.62 .17
Nov. 5.3	27.57 .21	28.72 .15	36.09 .21	17.06 1.66	61.16 1.33	47.20 .26	7.76 .16	10.45 .18
15.2	27.36 .20	28.58 .14	35.87 .21	15.40 1.64	62.51 1.35	46.93 .26	7.59 .15	10.27 .17
25.2	27.16 .18	28.44 .12	35.67 .20	13.77 1.56	63.86 1.31	46.67 .25	7.45 .14	10.10 .16
Dec. 5.2	26.99 − .16	28.33 − .10	35.47 − .19	12.25 −1.45	65.13 +1.29	46.42 − .24	7.31 − .13	9.94 − .15

APPROXIMATE NORTH POLAR DISTANCES AND APPARENT RIGHT ASCENSIONS, FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Octantis.	γ Aquarii.	σ Aquarii.	α Lacertæ.	10 Lacertæ.	β Octantis.	λ Pegasi.	Groombr. 1706, S. P.
	176° 31′	91° 56′	101° 14′	40° 17′	51° 31′	171° 57	67° 0′	348° 21′
	h m 22 10	h m 22 16	h m 22 24	h m 22 26	h m 22 34	h m 22 34	h m 22 41	h m 22 51
	s	s	s	s	s	s	s	s
July 8.6	59.91 +3.06	3.19 + .25	54.33 + .27	49.64 + .32	23.69 + .29	61.88 +1.42	18.25 + .27	12.00 − .62
18.6	62.76 2.61	3.43 .22	54.59 .24	49.94 .27	23.96 .25	63.24 1.29	18.51 .24	11.44 .50
28.6	65.13 2.10	3.64 .19	54.81 .20	50.19 .22	24.19 .21	64.45 1.10	18.74 .21	11.01 .37
Aug. 7.6	66.95 1.53	3.80 .15	55.00 .16	50.38 .16	24.38 .17	65.43 .85	18.92 .17	10.71 .24
17.5	68.19 .92	3.94 .11	55.14 .12	50.50 .10	24.52 .12	66.14 .58	19.07 .13	10.53 − .10
27.5	68.79 + .27	4.02 + .06	55.23 + .08	50.57 + .04	24.61 + .06	66.59 + .31	19.17 + .08	10.51 + .05
Sept. 6.5	68.73 − .40	4.06 + .02	55.29 + .04	50.59 − .01	24.64 + .01	66.76 + .02	19.23 + .03	10.63 .21
16.4	67.99 1.04	4.06 − .02	55.30 .00	50.55 .06	24.63 − .03	66.63 − .27	19.24 − .01	10.93 .37
26.4	66.66 1.63	4.03 .05	55.28 − .04	50.46 .11	24.59 .07	66.22 .55	19.21 .04	11.38 .52
Oct. 6.4	64.72 2.20	3.96 .08	55.22 .07	50.33 .15	24.50 .11	65.54 .79	19.16 .07	11.98 .67
16.4	62.27 −2.65	3.88 − .10	55.14 − .09	50.15 − .19	24.37 − .14	64.64 −1.00	19.07 − .10	12.72 + .82
26.3	59.43 3.00	3.77 .12	55.03 .11	49.95 .22	24.23 .16	63.54 1.18	18.96 .12	13.62 .95
Nov. 5.3	56.26 3.25	3.65 .13	54.92 .12	49.72 .24	24.06 .18	62.28 1.31	18.83 .13	14.62 1.06
15.3	52.94 3.34	3.52 .12	54.79 .13	49.47 .25	23.87 .19	60.92 1.38	18.71 .14	15.73 1.17
25.3	49.58 3.32	3.41 .11	54.67 .12	49.21 .25	23.69 .19	59.52 1.39	18.56 .14	16.95 1.24
Dec. 5.2	46.30 −3.18	3.29 − .10	54.56 − .11	48.96 − .24	23.50 − .19	58.14 −1.36	18.42 − .13	18.20 +1.27
15.2	43.27 −2.90	3.20 − .08	54.45 − .10	48.72 − .23	23.31 − .18	56.81 −1.28	18.30 − .11	19.48 +1.28

Mean Solar Date.	o Androm.	φ Aquarii.	τ Pegasi.	λ Androm.	i¹ Aquarii.	δ Sculptoris.	γ¹ Octantis.	33 Piscium.
	48° 16′	96° 38′	66° 51′	44° 8′	108° 53′	118° 44′	172° 37′	96° 19′
	h m 22 56	h m 23 8	h m 23 15	h m 23 32	h m 23 38	h m 23 43	h m 23 45	h m 23 59
	s	s	s	s	s	s	s	s
July 28.6	56.27 + .22	42.59 + .24	16.29 + .22	15.61 + .29	34.82 + .27	16.92 + .26	50.52 +1.48	47.06 + .25
Aug. 7.6	56.49 .20	42.81 .20	16.50 .19	15.88 .24	35.07 .23	17.17 .24	51.91 1.29	47.30 .23
17.6	56.66 .15	42.98 .16	16.68 .16	16.10 .19	35.28 .19	17.41 .21	53.10 1.06	47.52 .20
27.5	56.78 .10	43.12 .12	16.82 .12	16.27 .14	35.45 .15	17.60 .17	54.03 .79	47.70 .16
Sept. 6.5	56.85 + .04	43.21 .08	16.91 .07	16.39 .09	35.58 .11	17.75 .13	54.67 .50	47.85 .13
16.5	56.86 − .01	43.27 + .04	16.96 + .03	16.46 + .04	35.68 + .07	17.85 + .08	55.02 + .20	47.96 + .09
26.5	56.84 .05	43.28 .00	16.98 .00	16.48 .00	35.72 + .03	17.89 + .03	55.07 − .12	48.03 .05
Oct. 6.4	56.77 .09	43.27 − .03	16.96 − .04	16.46 − .04	35.73 − .01	17.91 − .01	54.78 .43	48.06 + .01
16.4	56.66 .12	43.22 .06	16.91 .07	16.39 .08	35.70 .04	17.88 .05	54.22 .71	48.05 − .02
26.4	56.53 .15	43.15 .08	16.82 .10	16.29 .12	35.65 .07	17.82 .08	53.35 .99	48.03 .04
Nov. 5.3	56.37 − .17	43.05 − .10	16.72 − .11	16.15 − .15	35.57 − .09	17.73 − .10	52.25 −1.20	47.98 − .06
15.3	56.19 .19	42.95 .11	16.61 .12	15.99 .17	35.47 .10	17.63 .12	50.94 1.37	47.90 .08
25.3	56.00 .20	42.84 .11	16.48 .13	15.80 .19	35.36 .11	17.50 .13	49.51 1.49	47.82 .09
Dec. 5.3	55.80 .20	42.73 .11	16.35 .13	15.60 .20	35.25 .12	17.37 .13	47.97 1.56	47.72 .10
15.2	55.61 .19	42.63 .10	16.23 .13	15.40 .20	35.13 .11	17.24 .13	46.39 1.57	47.62 .10
25.2	55.43 − .18	42.53 − .09	16.10 − .12	15.20 − .20	35.02 − .10	17.11 − .13	44.83 −1.50	47.52 − .10
35.2	55.25 − .17	42.46 − .07	15.98 − .11	14.99 − .20	34.92 − .09	16.99 − .12	43.36 −1.40	47.41 − .10

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 48 5.38	6 09	−22 59 36.5	35.7	11.034	+12.67	+ 3 50.91	16 18.41	1 11.08	18 44 14.55
2	18 52 30.05	30.85	22 54 18.6	17.6	11.021	13.81	4 19.03	16 18.41	1 11.03	18 48 11.11
3	18 56 54.40	55.28	22 48 33.3	32.1	11.007	14.95	4 46.82	16 18.40	1 10.98	18 52 7.67
4	19 1 18.38	19.34	22 42 20.7	19.3	10.990	16.08	5 14.24	16 18.38	1 10.93	18 56 4.23
5	19 5 41.95	42.99	22 35 41.2	39.6	10.973	17.20	5 41.25	16 18.35	1 10.87	19 0 0.79
6	19 10 5.07	6.19	−22 28 34.9	33.0	10.955	+18.32	+ 6 7.83	16 18.32	1 10.81	19 3 57.35
7	19 14 27.74	28.93	22 20 61.9	59.8	10.936	19.42	6 33.95	16 18.29	1 10.74	19 7 53.90
8	19 18 49.92	51.18	22 13 2.5	0.1	10.914	20.52	6 59.58	16 18.26	1 10.67	19 11 50.46
9	19 23 11.58	12.91	22 4 37.0	34.3	10.892	21.60	7 24.68	16 18.22	1 10.59	19 15 47.02
10	19 27 32.69	34.09	21 55 45.6	42.6	10.868	22.68	7 49.24	16 18.18	1 10.51	19 19 43.58
11	19 31 53.22	54.69	−21 46 28.4	25.1	10.842	+23.74	+ 8 13.21	16 18.14	1 10.43	19 23 40.13
12	19 36 13.14	14.68	21 36 45.8	42.2	10.816	24.79	8 36.58	16 18.09	1 10.35	19 27 36.69
13	19 40 32.42	34.03	21 26 38.1	34.2	10.790	25.82	8 59.31	16 18.04	1 10.26	19 31 33.25
14	19 44 51.05	52.72	21 16 5.7	1.5	10.762	26.85	9 21.38	16 17.98	1 10.17	19 35 29.81
15	19 49 9.00	10.73	21 5 8.8	4.3	10.733	27.86	9 42.78	16 17.92	1 10.08	19 39 26.36
16	19 53 26.25	28.03	−20 53 47.6	42.7	10.702	+28.87	+10 3.47	16 17.85	1 9.99	19 43 22.92
17	19 57 42.77	44.61	20 41 62.5	57.3	10.671	29.86	10 23.44	16 17.77	1 9.89	19 47 19.47
18	20 1 58.56	60.45	20 29 54.0	48.5	10.640	30.84	10 42.67	16 17.69	1 9.79	19 51 16.03
19	20 6 13.61	15.55	20 17 22.3	16.5	10.609	31.79	11 1.16	16 17.61	1 9.69	19 55 12.59
20	20 10 27.90	29.88	20 4 27.8	21.6	10.577	32.74	11 18.89	16 17.53	1 9.59	19 59 9.15
21	20 14 41.41	43.44	−19 51 10.8	4.3	10.545	+33.67	+11 35.84	16 17.44	1 9.49	20 3 5.71
22	20 18 54.14	56.21	19 37 31.7	24.9	10.513	34.58	11 52.01	16 17.34	1 9.38	20 7 2.27
23	20 23 6.08	8.19	19 23 30.9	23.7	10.481	35.48	12 7.38	16 17.24	1 9.27	20 10 58.83
24	20 27 17.22	19.37	19 9 8.6	1.1	10.448	36.36	12 21.96	16 17.13	1 9.16	20 14 55.38
25	20 31 27.57	29.75	18 54 25.3	17.5	10.415	37.23	12 35.75	16 17.01	1 9.05	20 18 51.94
26	20 35 37.12	39.33	−18 39 21.3	13.2	10.382	+38.09	+12 48.74	16 16.89	1 8.94	20 22 48.50
27	20 39 45.87	48.11	18 23 57.1	48.7	10.349	38.92	13 0.93	16 16.76	1 8.83	20 26 45.06
28	20 43 53.83	56.09	18 8 13.0	4.2	10.315	39.74	13 12.32	16 16.63	1 8.71	20 30 41.61
29	20 48 0.98	3.26	17 52 9.4	0.3	10.282	40.55	13 22.91	16 16.49	1 8.60	20 34 38.16
30	20 52 7.32	9.62	17 35 46.5	37.1	10.248	41.34	13 32.69	16 16.35	1 8.48	20 38 34.72
31	20 56 12.86	15.18	−17 18 64.8	55.2	10.215	+42.11	+13 41.67	16 16.20	1 8.37	20 42 31.27
Feb. 1	21 0 17.60	19.94	17 1 64.8	55.0	10.181	42.86	13 49.85	16 16.05	1 8.25	20 46 27.82
2	21 4 21.54	23.89	16 44 46.9	36.8	10.148	43.60	13 57.23	16 15.89	1 8.14	20 50 24.38
3	21 8 24.68	27.04	16 27 11.3	0.9	10.114	44.34	14 3.80	16 15.73	1 8.02	20 54 20.94
4	21 12 27.02	29.39	16 9 18.4	7.8	10.081	45.05	14 9.57	16 15.56	1 7.91	20 58 17.50
5	21 16 28.56	30.94	−15 50 68.8	58.0	10.048	+45.74	+14 14.54	16 15.39	1 7.79	21 2 14.06
6	21 20 29.30	31.68	15 32 42.9	31.9	10.014	46.41	14 18.71	16 15.22	1 7.68	21 6 10.62
7	21 24 29.24	31.62	15 13 61.0	49.8	9.981	47.07	14 22.09	16 15.04	1 7.56	21 10 7.17
8	21 28 28.39	30.77	14 54 63.6	52.2	9.948	47.70	14 24.68	16 14.87	1 7.45	21 14 3.72
9	21 32 26.75	29.13	14 35 51.1	39.5	9.915	48.32	14 26.48	16 14.69	1 7.34	21 18 0.28
10	21 36 24.32	26.70	−14 16 24.0	12.2	9.883	+48.92	+14 27.49	16 14.51	1 7.23	21 21 56.83
11	21 40 21.10	23.47	13 56 42.6	30.7	9.850	49.51	14 27.71	16 14.33	1 7.12	21 25 53.39
12	21 44 17.10	19.46	13 36 47.5	35.4	9.817	50.07	14 27.15	16 14.15	1 7.01	21 29 49.95
13	21 48 12.32	14.67	13 16 39.1	26.9	9.785	50.61	14 25.81	16 13.96	1 6.90	21 33 46.50
14	21 52 6.78	9.12	12 56 17.8	5.5	9.753	51.14	14 23.71	16 13.77	1 6.79	21 37 43.05
15	21 56 0.49	2.82	−12 35 44.0	31.6	9.721	+51.66	+14 20.86	16 13.57	1 6.69	21 41 39.60
16	21 59 53.46	55.77	−12 14 58.1	45.6	9.691	+52.15	+14 17.26	16 13.37	1 6.58	21 45 36.16

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 59 53.46	55.77	−12 14 58.1	45.6	9.691	+52.15	+14 17.26	16 13.37	1 6.58	21 45 36.16
17	22 3 45.69	47.98	11 53 60.6	48.1	9.661	52.63	14 12.93	16 13.17	1 6.48	21 49 32.71
18	22 7 37.21	39.48	11 32 52.0	39.5	9.632	53.08	14 7.89	16 12.97	1 6.38	21 53 29.27
19	22 11 28.03	30.28	11 11 32.6	20.1	9.603	53.52	14 2.15	16 12.76	1 6.28	21 57 25.82
20	22 15 18.17	20.39	10 49 62.8	50.3	9.575	53.95	13 55.73	16 12.54	1 6.18	22 1 22.38
21	22 19 7.63	9.83	−10 28 23.0	10.5	9.548	+54.35	+13 48.64	16 12.32	1 6.09	22 5 18.93
22	22 22 56.45	58.62	10 6 33.7	21.2	9.521	54.74	13 40.90	16 12.10	1 6.00	22 9 15.48
23	22 26 44.64	46.78	9 44 35.2	22.8	9.496	55.12	13 32.53	16 11.87	1 5.91	22 13 12.04
24	22 30 32.22	34.33	9 22 27.9	15.5	9.471	55.48	13 23.55	16 11.64	1 5.82	22 17 8.59
25	22 34 19.22	21.30	8 59 72.2	59.9	9.446	55.83	13 13.99	16 11.41	1 5.74	22 21 5.15
26	22 38 5.65	7.70	− 8 37 48.4	36.2	9.423	+56.15	+13 3.86	16 11.17	1 5.66	22 25 1.70
27	22 41 51.53	53.55	8 15 16.9	4.8	9.401	56.47	12 53.19	16 10.93	1 5.58	22 28 58.25
28	22 45 36.88	38.87	7 52 38.2	26.2	9.380	56.76	12 41.99	16 10.68	1 5.50	22 32 54.80
Mar. 1	22 49 21.73	23.68	7 29 52.6	40.7	9.359	57.04	12 30.28	16 10.43	1 5.43	22 36 51.36
2	22 53 6.09	8.01	7 6 60.4	48.6	9.339	57.30	12 18.08	16 10.18	1 5.36	22 40 47.91
3	22 56 49.98	51.86	− 6 43 62.1	50.5	9.319	+57.55	+12 5.41	16 9.93	1 5.29	22 44 44.47
4	23 0 33.42	35.26	6 20 58.1	46.6	9.301	57.78	11 52.29	16 9.68	1 5.22	22 48 41.02
5	23 4 16.43	18.23	5 57 48.7	37.4	9.283	57.99	11 38.74	16 9.42	1 5.15	22 52 37.57
6	23 7 59.02	60.78	5 34 34.3	23.2	9.267	58.19	11 24.78	16 9.16	1 5.09	22 56 34.12
7	23 11 41.21	42.93	5 11 15.3	4.4	9.251	58.38	11 10.42	16 8.90	1 5.03	23 0 30.68
8	23 15 23.02	24.70	− 4 47 52.1	41.4	9.235	+58.54	+10 55.68	16 8.63	1 4.97	23 4 27.23
9	23 19 4.47	6.10	4 24 25.1	14.6	9.220	58.70	10 40.57	16 8.37	1 4.92	23 8 23.79
10	23 22 45.57	47.16	4 0 54.7	44.4	9.206	58.83	10 25.11	16 8.11	1 4.87	23 12 20.34
11	23 26 26.33	27.88	3 37 21.4	11.3	9.192	58.94	10 9.32	16 7.85	1 4.82	23 16 16.90
12	23 30 6.77	8.28	3 13 45.5	35.7	9.179	59.04	9 53.21	16 7.59	1 4.77	23 20 13.45
13	23 33 46.91	48.38	− 2 49 67.4	57.9	9.166	+59.13	+ 9 36.80	16 7.33	1 4.73	23 24 10.00
14	23 37 26.77	28.20	2 26 27.5	18.3	9.155	59.19	9 20.11	16 7.07	1 4.69	23 28 6.55
15	23 41 6.37	7.75	2 2 46.3	37.4	9.144	59.23	9 3.15	16 6.80	1 4.65	23 32 3.11
16	23 44 45.71	47.05	1 38 64.1	55.5	9.134	59.25	8 45.94	16 6.54	1 4.62	23 35 59.66
17	23 48 24.83	26.12	1 15 21.3	13.0	9.125	59.27	8 28.52	16 6.27	1 4.59	23 39 56.21
18	23 52 3.75	4.99	− 0 51 38.3	30.3	9.118	+59.28	+ 8 10.89	16 6.01	1 4.57	23 43 52.76
19	23 55 42.47	43.67	0 27 55.4	47.6	9.111	59.28	7 53.06	16 5.74	1 4.55	23 47 49.32
20	23 59 21.03	22.19	− 0 4 13.0	5.5	9.105	59.25	7 35.06	16 5.47	1 4.53	23 51 45.87
21	0 2 59.45	60.57	+ 0 19 28.6	35.8	9.099	59.21	7 16.94	16 5.20	1 4.51	23 55 42.42
22	0 6 37.76	38.83	0 43 8.9	15.8	9.095	59.16	6 58.70	16 4.93	1 4.49	23 59 38.97
23	0 10 15.97	16.99	+ 1 6 47.6	54.2	9.091	+59.08	+ 6 40.36	16 4.66	1 4.48	0 3 35.53
24	0 13 54.10	55.07	1 30 24.4	30.7	9.089	59 00	6 21.95	16 4.38	1 4.48	0 7 32.08
25	0 17 32.18	33.10	1 53 59.1	65.0	9 087	58.90	6 3.48	16 4.10	1 4.47	0 11 28.64
26	0 21 10.25	11.12	2 17 31.2	36.8	9.086	58.78	5 44.99	16 3.82	1 4.47	0 15 25.19
27	0 24 48.31	49.14	2 41 0.4	5.7	9.086	58.65	5 26.50	16 3.54	1 4.47	0 19 21.79
28	0 28 26.40	27.18	+ 3 4 26.5	31.5	9.088	+56.51	+ 5 8.04	16 3.26	1 4.47	0 23 18.29
29	0 32 4.53	5.26	3 27 49.0	53.6	9.091	58.36	4 49.63	16 2.98	1 4.48	0 27 14.85
30	0 35 42.73	43.41	3 51 7.7	12.0	9.094	58.19	4 31.29	16 2.70	1 4.49	0 31 11.40
31	0 39 21.03	21.66	4 14 22.1	26.1	9.098	58.01	4 13.04	16 2.41	1 4.50	0 35 7.95
32	0 42 59.44	60.03	4 37 32.0	35.7	9.103	57.82	3 54.89	16 2.13	1 4.51	0 39 4.50
33	0 46 37.97	38.52	+ 5 0 37.2	40.6	9.108	+57.60	+ 3 36.86	16 1.85	1 4.53	0 43 1.06
34	0 50 16.64	17.14	+ 5 23 37.2	40.3	9.114	+57.38	+ 3 18.98	16 1.56	1 4.55	0 46 57.61

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 42 59.44	60.03	+ 4 37 32.0	35.7	9.103	+57.82	+3 54.89	16 2.13	1 4.51	0 39 4.50
2	0 46 37.97	38.52	5 0 37.2	40.6	9.108	57.60	3 36.86	16 1.85	1 4.53	0 43 1.06
3	0 50 16.64	17.14	5 23 37.2	40.3	9.114	57.38	3 18.99	16 1.56	1 4.55	0 46 57.61
4	0 53 55.47	55.93	5 46 31.5	34.3	9.121	57.14	3 1.27	16 1.28	1 4.57	0 50 54.17
5	0 57 34.49	34.91	6 9 19.9	22.4	9.130	56.88	2 43.74	16 1.00	1 4.60	0 54 50.72
6	1 1 13.72	14.09	+ 6 32 2.1	4.3	9.138	+56.61	+2 26.41	16 0.72	1 4.63	0 58 47.28
7	1 4 53.15	53.47	6 54 37.6	39.6	9.147	56.32	2 9.30	16 0.44	1 4.66	1 2 43.83
8	1 8 32.81	33.09	7 17 6.2	7.9	9.156	56.04	1 52.41	16 0.17	1 4.70	1 6 40.38
9	1 12 12.71	12.95	7 39 27.4	28.9	9.167	55.72	1 35.76	15 59.89	1 4.73	1 10 36.94
10	1 15 52.87	53.07	8 1 40.9	42.2	9.179	55.40	1 19.37	15 59.62	1 4.77	1 14 33.50
11	1 19 33.29	33.45	+ 8 23 46.3	47.3	9.191	+55.05	+1 3.24	15 59.35	1 4.81	1 18 30.05
12	1 23 14.00	14.12	8 45 43.2	43.9	9.203	54.69	0 47.40	15 59.08	1 4.86	1 22 26.61
13	1 26 55.00	55.08	9 7 31.2	31.7	9.215	54.32	0 31.85	15 58.81	1 4.90	1 26 23.16
14	1 30 36.31	36.35	9 29 10.1	10.4	9.228	53.93	0 16.61	15 58.55	1 4.95	1 30 19.71
15	1 34 17.94	17.94	9 50 39.4	39.5	9.242	53.53	+0 1.69	15 58.29	1 5.00	1 34 16.26
16	1 37 59.91	59.87	+10 11 58.8	58.6	9.256	+53.10	−0 12.89	15 58.03	1 5.06	1 38 12.81
17	1 41 42.24	42.16	10 33 8.0	7.6	9.271	52.67	0 27.12	15 57.77	1 5.11	1 42 9.37
18	1 45 24.93	24.82	10 54 6.7	6.1	9.286	52.23	0 40.98	15 57.51	1 5.17	1 46 5.93
19	1 49 8.01	7.87	11 14 54.6	53.8	9.303	51.77	0 54.46	15 57.25	1 5.23	1 50 2.48
20	1 52 51.48	51.31	11 35 31.3	30.3	9.320	51.29	1 7.53	15 56.99	1 5.29	1 53 59.03
21	1 56 35.38	35.18	+11 55 56.5	55.3	9.338	+50.81	−1 20.19	15 56.74	1 5.35	1 57 55.59
22	2 0 19.71	19.47	12 16 9.8	8.5	9.356	50.30	1 32.42	15 56.49	1 5.42	2 1 52.14
23	2 4 4.49	4.22	12 36 10.9	9.5	9.375	49.79	1 44.20	15 56.23	1 5.49	2 5 48.70
24	2 7 49.73	49.43	12 55 59.6	58.0	9.395	49.27	1 55.52	15 55.98	1 5.56	2 9 45.26
25	2 11 35.44	35.11	13 15 35.7	34.0	9.415	48.73	2 6.36	15 55.73	1 5.63	2 13 41.81
26	2 15 21,65	21.29	+13 34 58.8	57.0	9.436	+48.18	−2 16.70	15 55.48	1 5.70	2 17 38.36
27	2 19 8.37	7.98	13 54 8.6	6.7	9.457	47.62	2 26.53	15 55.23	1 5.78	2 21 34.92
28	2 22 55.60	55.19	14 13 4.8	2.8	9.479	47.05	2 35.85	15 54.98	1 5.86	2 25 31.47
29	2 26 43.36	42.93	14 31 47.0	44.9	9.501	46.47	2 44.64	15 54.73	1 5.93	2 29 28.03
30	2 30 31.67	31.22	14 50 15.0	12.8	9.524	45.86	2 52.89	15 54.48	1 6.01	2 33 24.58
May 1	2 34 20.53	20.06	+15 8 28.4	26.2	9.547	+45.25	−3 0.58	15 54.23	1 6.08	2 37 21.14
2	2 38 9.95	9.46	15 26 27.0	24.7	9.571	44.62	3 7.72	15 53.99	1 6.16	2 41 17.69
3	2 41 59.92	59.41	15 44 10.3	8.0	9.594	43.98	3 14.31	15 53.75	1 6.24	2 45 14.24
4	2 45 50.46	49.93	16 1 38.1	35.8	9.618	43.33	3 20.33	15 53.51	1 6.32	2 49 10.80
5	2 49 41.57	41.03	16 18 50.2	47.8	9.641	42.67	3 25.77	15 53.28	1 6.40	2 53 7.36
6	2 53 33.26	32.70	+16 35 46.1	43.6	9.665	+41.98	−3 30.64	15 53.05	1 6.48	2 57 3.91
7	2 57 25.52	24.94	16 52 25.5	23.0	9.689	41.29	3 34.94	15 52.83	1 6.56	3 1 0.47
8	3 1 18.35	17.76	17 8 48.1	45.6	9.713	40.59	3 38.67	15 52.61	1 6.64	3 4 57.03
9	3 5 11.75	11.15	17 24 53.5	51.0	9.737	39.86	3 41.82	15 52.40	1 6.72	3 8 53.59
10	3 9 5.72	5.11	17 40 41.5	39.0	9.761	39.13	3 44.40	15 52.19	1 6.80	3 12 50.14
11	3 12 60.26	59.64	+17 56 11.7	9.2	9.785	+38.39	−3 46.42	15 51.98	1 6.88	3 16 46.70
12	3 16 55.36	54.74	18 11 23.8	21.4	9.808	37.63	3 47.88	15 51.77	1 6.97	3 20 43.25
13	3 20 51.03	50.41	18 26 17.5	15.1	9.831	36.86	3 48.77	15 51.57	1 7.05	3 24 39.81
14	3 24 47.25	46.63	18 40 52.5	50.2	9.854	36.07	3 49.10	15 51.37	1 7.13	3 28 36.36
15	3 28 44.02	43.40	18 55 8.6	6.3	9.877	35.27	3 48.89	15 51.18	1 7.21	3 32 32.92
16	3 32 41.34	40.72	+19 9 5.4	3.2	9.900	+34.47	−3 48.13	15 50.99	1 7.30	3 36 29.48
17	3 36 39.21	38.59	+19 22 42.7	40.5	9.923	+33.65	−3 46.83	15 50.80	1 7.38	3 40 26.04

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 36 39.21	38.59	+19 22 42.7	40.5	9.923	+33.65	−3 46.83	15 50.80	1 7.38	3 40 26.04
18	3 40 37.62	37.00	19 35 60.2	58.1	9.945	32.82	3 44.98	15 50.62	1 7.46	3 44 22.60
19	3 44 36.57	35.95	19 48 57.7	55.7	9.968	31.98	3 42.58	15 50.44	1 7.54	3 48 19.15
20	3 48 36.05	35.44	20 1 34.9	33.0	9.990	31.13	3 39.65	15 50.26	1 7.62	3 52 15.70
21	3 52 36.07	35.47	20 13 51.6	49.7	10.012	30.27	3 36.19	15 50.08	1 7.70	3 56 12.26
22	3 56 36.62	36.03	+20 25 47.6	45.8	10.034	+29.39	−3 32.21	15 49.91	1 7.77	4 0 8.82
23	4 0 37.69	37.11	20 37 22.6	20.9	10.055	28.51	3 27.70	15 49.73	1 7.85	4 4 5.38
24	4 4 39.28	38.71	20 48 36.4	34.8	10.076	27.63	3 22.67	15 49.56	1 7.92	4 8 1.94
25	4 8 41.38	40.83	20 59 28.8	27.3	10.098	26.73	3 17.12	15 49.40	1 7.99	4 11 58.49
26	4 12 43.99	43.45	21 9 59.7	58.3	10.119	25.83	3 11.07	15 49.24	1 8.06	4 15 55.05
27	4 16 47.09	46.56	+21 20 8.7	7.4	10.139	+24.91	−3 4.53	15 49.08	1 8.12	4 19 51.61
28	4 20 50.67	50.16	21 29 55.7	54.5	10.159	23.99	2 57.50	15 48.92	1 8.18	4 23 48.16
29	4 24 54.73	54.24	21 39 20.4	19.3	10.179	23.06	2 49.99	15 48.76	1 8.24	4 27 44.72
30	4 28 59.26	58.79	21 48 22.8	21.8	10.198	22.13	2 42.02	15 48.61	1 8.30	4 31 41.28
31	4 33 4.24	3.79	21 57 2.5	1.6	10.216	21.18	2 33.60	15 48.46	1 8.36	4 35 37.84
June 1	4 37 9.66	9.24	+22 5 19.4	18.6	10.234	+20.22	−2 24.74	15 48.32	1 8.42	4 39 34.39
2	4 41 15.50	15.11	22 13 13.3	12.6	10.251	19.26	2 15.46	15 48.18	1 8.48	4 43 30.95
3	4 45 21.73	21.37	22 20 44.0	43.4	10.267	18.29	2 5.79	15 48.04	1 8.53	4 47 27.51
4	4 49 28.32	27.99	22 27 51.3	50.7	10.282	17.31	1 55.75	15 47.91	1 8.58	4 51 24.07
5	4 53 35.27	34.97	22 34 35.0	34.5	10.297	16.33	1 45.34	15 47.79	1 8.63	4 55 20.62
6	4 57 42.58	42.31	+22 40 55.1	54.7	10.310	+15.34	−1 34.61	15 47.67	1 8.67	4 59 17.18
7	5 1 50.19	49.95	22 46 51.3	51.0	10.322	14.35	1 23.57	15 47.56	1 8.71	5 3 13.74
8	5 5 58.08	57.87	22 52 23.6	23.3	10.333	13.35	1 12.24	15 47.45	1 8.75	5 7 10.30
9	5 10 6.23	6.05	22 57 31.7	31.5	10.344	12.34	1 0.64	15 47.35	1 8.79	5 11 6.86
10	5 14 14.61	14.47	23 2 15.5	15.4	10.354	11.33	0 48.81	15 47.25	1 8.83	5 15 3.41
11	5 18 23.21	23.11	+23 6 35.0	35.0	10.362	+10.31	−0 36.77	15 47.15	1 8.86	5 18 59.97
12	5 22 32.00	31.93	23 10 30.1	30.1	10.369	9.29	0 24.54	15 47.06	1 8.88	5 22 56.53
13	5 26 40.95	40.92	23 14 0.6	0.6	10.376	8.26	−0 12.14	15 46.98	1 8.90	5 26 53.09
14	5 30 50.04	50.05	23 17 6.5	6.5	10.381	7.23	+0 0.39	15 46.91	1 8.92	5 30 49.65
15	5 34 59.24	59.28	23 19 47.7	47.7	10.386	6.20	0 13.04	15 46.84	1 8.94	5 34 46.21
16	5 39 8.54	8.61	+23 22 4.2	4.2	10.389	+ 5.17	+0 25.79	15 46.77	1 8.96	5 38 42.77
17	5 43 17.92	18.03	23 23 56.0	56.0	10.391	4.14	0 38.61	15 46.70	1 8.97	5 42 39.32
18	5 47 27.35	27.49	23 25 23.0	23.0	10.393	3.11	0 51.48	15 46.63	1 8.98	5 46 35.88
19	5 51 36.81	36.99	23 26 25.3	25.3	10.394	2.07	1 4.38	15 46.57	1 8.98	5 50 32.44
20	5 55 46.28	46.50	23 27 2.8	2.8	10.394	1.04	1 17.29	15 46.51	1 8.98	5 54 29.00
21	5 59 55.74	56.00	+23 27 15.5	15.5	10.394	+ 0.01	+1 30.19	15 46.46	1 8.98	5 58 25.56
22	6 4 5.17	5.47	23 27 3.5	3.4	10.393	− 1.02	1 43.06	15 46.41	1 8.98	6 2 22.12
23	6 8 14.56	14.89	23 26 26.6	26.5	10.390	2.05	1 55.90	15 46.36	1 8.97	6 6 18.67
24	6 12 23.88	24.25	23 25 25.0	24.9	10.387	3.08	2 8.67	15 46.32	1 8.96	6 10 15.23
25	6 16 33.12	33.53	23 23 58.8	58.6	10.383	4.11	2 21.35	15 46.29	1 8.94	6 14 11.79
26	6 20 42.25	42.69	+23 22 7.9	7.7	10.378	− 5.14	+2 33.92	15 46.25	1 8.92	6 18 8.35
27	6 24 51.25	51.73	23 19 52.4	52.2	10.373	6.16	2 46.36	15 46.21	1 8.90	6 22 4.91
28	6 29 0.11	0.62	23 17 12.4	12.1	10.366	7.18	2 58.66	15 46.18	1 8.87	6 26 1.47
29	6 33 8.80	9.34	23 14 7.8	7.4	10.359	8.20	3 10.80	15 46.16	1 8.84	6 29 58.03
30	6 37 17.29	17.87	23 10 38.8	38.3	10.350	9.21	3 22.74	15 46.14	1 8.81	6 33 54.58
31	6 41 25.57	26.19	+23 6 45.4	44.8	10.340	−10.22	+3 34.46	15 46.12	1 8.78	6 37 51.14
32	6 45 33.61	34.26	+23 2 27.8	27.1	10.330	−11.23	+3 45.94	15 46.11	1 8.74	6 41 47.70

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 41 25.57	26.19	+23 6 45.4	44.8	10.340	−10.22	+3 34.46	15 46.12	1 8.78	6 37 51.14
2	6 45 33.61	34.26	23 2 27.8	27.1	10.330	11.23	3 45.94	15 46.11	1 8.74	6 41 47.70
3	6 49 41.39	42.07	22 57 46.1	45.3	10.318	12.23	3 57.16	15 46.10	1 8.70	6 45 44.26
4	6 53 48.87	49.58	22 52 40.3	39.4	10.305	13.24	4 8.09	15 46.10	1 8.66	6 49 40.81
5	6 57 56.05	56.79	22 47 10.6	9.6	10.292	14.23	4 18.71	15 46.11	1 8.61	6 53 37.37
6	7 2 2.90	3.66	+22 41 17.1	16.0	10.278	−15.22	+4 29.00	15 46.12	1 8.56	6 57 33.93
7	7 6 9.39	10.18	22 34 60.0	58.8	10.263	16.21	4 38.93	15 46.14	1 8.51	7 1 30.49
8	7 10 15.50	16.31	22 28 19.4	18.1	10.246	17.18	4 48.48	15 46.17	1 8.46	7 5 27.05
9	7 14 21.20	22.03	22 21 15.4	14.0	10.229	18.15	4 57.62	15 46.20	1 8.40	7 9 23.61
10	7 18 26.47	27.33	22 13 48.3	46.8	10.211	19.10	5 6.34	15 46.23	1 8.34	7 13 20.17
11	7 22 31.30	32.18	+22 5 58.2	56.5	10.192	−20.05	+5 14.61	15 46.27	1 8.28	7 17 16.73
12	7 26 35.67	36.57	21 57 45.3	43.5	10.172	20.99	5 22.43	15 46.31	1 8.22	7 21 13.28
13	7 30 39.57	40.49	21 49 9.8	7.8	10.152	21.93	5 29.76	15 46.36	1 8.15	7 25 9.84
14	7 34 42.97	43.91	21 40 11.9	9.8	10.131	22.86	5 36.60	15 46.41	1 8.09	7 29 6.40
15	7 38 45.86	46.82	21 30 51.9	49.6	10.109	23.78	5 42.93	15 46.47	1 8.02	7 33 2.96
16	7 42 48.23	49.21	+21 21 10.0	7.6	10.087	−24.69	+5 48.75	15 46.53	1 7.95	7 36 59.51
17	7 46 50.07	51.06	21 11 6.4	3.9	10.065	25.60	5 54.03	15 46.60	1 7.88	7 40 56.07
18	7 50 51.37	52.37	21 0 41.2	38.6	10.043	26.49	5 58.77	15 46.67	1 7.80	7 44 52.63
19	7 54 52.13	53.13	20 49 54.8	52.0	10.020	27.38	6 2.96	15 46.75	1 7.72	7 48 49.18
20	7 58 52.33	53.34	20 38 47.3	44.4	9.997	28.24	6 6.60	15 46.83	1 7.64	7 52 45.74
21	8 2 51.97	52.99	+20 27 19.1	16.1	9.973	−29.10	+6 9.68	15 46.91	1 7.56	7 56 42.30
22	8 6 51.05	52.08	20 15 30.3	27.2	9.950	29.96	6 12.20	15 46.99	1 7.48	8 0 38.86
23	8 10 49.57	50.60	20 3 21.1	17.9	9.926	30.80	6 14.16	15 47.07	1 7.40	8 4 35.42
24	8 14 47.52	48.55	19 50 51.9	48.6	9.903	31.63	6 15.56	15 47.16	1 7.32	8 8 31.97
25	8 18 44.90	45.92	19 37 62.9	59.5	9.879	32.44	6 16.38	15 47.25	1 7.23	8 12 28.53
26	8 22 41.70	42.72	+19 24 54.3	50.8	9.855	−33.25	+6 16.62	15 47.34	1 7.15	8 16 25.09
27	8 26 37.92	38.94	19 11 26.3	22.7	9.831	34.05	6 16.29	15 47.44	1 7.06	8 20 21.64
28	8 30 33.57	34.59	18 57 39.2	35.6	9.807	34.85	6 15.38	15 47.54	1 6.98	8 24 18.20
29	8 34 28.64	29.66	18 43 33.3	29.7	9.783	35.62	6 13.89	15 47.65	1 6.89	8 28 14.75
30	8 38 23.13	24.14	18 29 8.9	5.2	9.759	36.39	6 11.81	15 47.76	1 6.80	8 32 11.31
31	8 42 17.02	18.02	+18 14 26.2	22.4	9.734	−37.15	+6 9.14	15 47.88	1 6.71	8 36 7.87
Aug. 1	8 46 10.32	11.31	17 59 25.5	21.7	9.709	37.90	6 5.89	15 48.00	1 6.62	8 40 4.43
2	8 50 3.03	4.00	17 44 7.1	3.2	9.684	38.63	6 2.04	15 48.12	1 6.54	8 44 0.99
3	8 53 55.15	56.10	17 28 31.3	27.4	9.659	39.34	5 57.30	15 48.25	1 6.45	8 47 57.54
4	8 57 46.67	47.61	17 12 38.4	34.5	9.634	40.05	5 52.56	15 48.38	1 6.36	8 51 54.09
5	9 1 37.59	38.52	+16 56 28.7	24.8	9.610	−40.75	+5 46.93	15 48.52	1 6.27	8 55 50.64
6	9 5 27.91	28.82	16 39 62.5	58.6	9.585	41.43	5 40.69	15 48.67	1 6.19	8 59 47.20
7	9 9 17.63	18.52	16 23 20.1	16.2	9.560	42.10	5 33.84	15 48.82	1 6.10	9 3 43.76
8	9 13 6.75	7.62	16 6 21.9	18.1	9.534	42.75	5 26.40	15 48.97	1 6.02	9 7 40.32
9	9 16 55.27	56.12	15 49 8.2	4.5	9.509	43.38	5 18.36	15 49.14	1 5.93	9 11 36.88
10	9 20 43.20	44.02	+15 31 39.3	35.6	9.485	−44.01	+5 9.74	15 49.31	1 5.85	9 15 33.44
11	9 24 30.54	31.33	15 13 55.5	51.8	9.460	44.63	5 0.53	15 49.48	1 5.77	9 19 29.99
12	9 28 17.30	18.06	14 55 57.1	53.5	9.436	45.23	4 50.74	15 49.65	1 5.69	9 23 26.54
13	9 32 3.49	4.22	14 37 44.5	41.0	9.412	45.80	4 40.37	15 40.83	1 5.61	9 27 23.10
14	9 35 49.11	49.81	14 19 18.1	14.6	9.389	46.38	4 29.44	15 50.01	1 5.53	9 31 19.65
15	9 39 34.18	34.85	+14 0 38.0	34.6	9.366	−46.95	+4 17.95	15 50.19	1 5.45	9 35 16.21
16	9 43 18.71	19.35	+13 41 44.6	41.3	9.344	−47.50	+4 5.92	15 50.37	1 5.37	9 39 12.76

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 43 18.71	19.35	+13 41 44.6	41.3	9.344	−47.50	+ 4 5.92	15 50.37	1 5.37	9 39 12.76
17	9 47 2.71	3.32	13 22 38.2	35.0	9.323	48.03	3 53.36	15 50.56	1 5.29	9 43 9.32
18	9 50 46.19	46.76	13 3 19.2	16.2	9.302	48.55	3 40.29	15 50.75	1 5.22	9 47 5.87
19	9 54 29.17	29.70	12 43 47.8	44.9	9.282	49.06	3 26.72	15 50.94	1 5.15	9 51 2.43
20	9 58 11.67	12.16	12 24 4.3	1.6	9.262	49.55	3 12.67	15 51.13	1 5.08	9 54 58.98
21	10 1 53.70	54.15	+12 4 9.0	6.5	9.243	−50.04	+ 2 58.15	15 51.32	1 5.02	9 58 55.53
22	10 5 35.28	35.70	11 43 62.2	59.9	9.224	50.52	2 43.17	15 51.52	1 4.96	10 2 52.09
23	10 9 16.43	16.81	11 23 44.3	42.2	9.206	50.98	2 27.76	15 51.72	1 4.89	10 6 48.65
24	10 12 57.16	57.50	11 3 15.5	13.6	9.188	51.42	2 11.93	15 51.92	1 4.83	10 10 45.20
25	10 16 37.47	37.77	10 42 36.1	34.4	9.172	51.86	1 55.70	15 52.12	1 4.77	10 14 41.76
26	10 20 17.40	17.65	+10 21 46.4	44.9	9.156	−52.28	+ 1 39.07	15 52.33	1 4.71	10 18 38.31
27	10 23 56.96	57.17	10 0 46.6	45.3	9.141	52.69	1 22.07	15 52 54	1 4.65	10 22 34.87
28	10 27 36.17	36.33	9 39 37.2	36.2	9.126	53.08	1 4.73	15 52.75	1 4.60	10 26 31.42
29	10 31 15.03	15.15	9 18 18.5	17.8	9.112	53.46	0 47.05	15 52.97	1 4.55	10 30 27.97
30	10 34 53.56	53.64	8 56 50.8	50.4	9.099	53.84	0 29.04	15 53.19	1 4.50	10 34 24.52
31	10 38 31.78	31.81	+ 8 35 14.3	14.2	9.086	−54.19	+ 0 10.70	15 53.41	1 4.45	10 38 21.08
Sept. 1	10 42 9.69	9.67	8 13 29.4	29.6	9.073	54.53	− 0 7.94	15 53.64	1 4.40	10 42 17.64
2	10 45 47.31	47.25	7 51 36.5	37.0	9.062	54.86	0 26.87	15 53.87	1 4.35	10 46 14.19
3	10 49 24.66	24.55	7 29 36.0	36.8	9.051	55.17	0 46.07	15 54.10	1 4.31	10 50 10.74
4	10 53 1.76	1.60	7 7 28.1	29.2	9.040	55.47	1 5.53	15 54.34	1 4.27	10 54 7.30
5	10 56 38.61	38.40	+ 6 45 13.2	14.6	9.030	−55.76	− 1 25.23	15 54.58	1 4.24	10 58 3.85
6	11 0 15.22	14.96	6 22 51.6	53.3	9.021	56.03	1 45.16	15 54.82	1 4.21	11 2 0.40
7	11 3 51.62	51.31	6 0 23.8	25.8	9.012	56.28	2 5.31	15 55.07	1 4.18	11 5 56.95
8	11 7 27.82	27.46	5 37 50.1	52.4	9.004	56.52	2 25.66	15 55.32	1 4.16	11 9 53.51
9	11 11 3.83	3.42	5 15 10.8	13.5	8.997	56.74	2 46.20	15 55.58	1 4.14	11 13 50.07
10	11 14 39.67	39.21	+ 4 52 26.3	29.3	8.991	−56.95	− 3 6.90	15 55.84	1 4.12	11 17 46.62
11	11 18 15.37	14.86	4 29 36.9	40.2	8.985	57.15	3 27.75	15 56.10	1 4.10	11 21 43.17
12	11 21 50.94	50.38	4 6 42.9	46.5	8.980	57.34	3 48.74	15 56.36	1 4.08	11 25 39.73
13	11 25 26.40	25.78	3 43 44.6	48.6	8.976	57.50	4 9.82	15 56.62	1 4.07	11 29 36.28
14	11 29 1.78	1.11	3 20 42.4	46.8	8.973	57.66	4 30.99	15 56.88	1 4.06	11 33 32.83
15	11 32 37.09	36.37	+ 2 57 36.7	41.4	8.971	−57.81	− 4 52.22	15 57.15	1 4.05	11 37 29.38
16	11 36 12.36	11.59	2 34 27.7	32.7	8.970	57.94	5 13.50	15 57.41	1 4.05	11 41 25.94
17	11 39 47.61	46.78	2 11 15.7	21.1	8.970	58.05	5 34.80	15 57.67	1 4.05	11 45 22.49
18	11 43 22.86	21.98	1 48 1.0	6.8	8.970	58.16	5 56.09	15 57.93	1 4.05	11 49 19.04
19	11 46 58.14	57.21	1 24 44.1	50.2	8.972	58.25	6 17.36	15 58.20	1 4.06	11 53 15.60
20	11 50 33.48	32.50	+ 1 1 25.1	31.5	8.975	−58.32	− 6 38.57	15 58.46	1 4.07	11 57 12.15
21	11 54 8.90	7.86	0 38 4.4	11.2	8.978	58.39	6 59.70	15 58.73	1 4.08	12 1 8.71
22	11 57 44.42	43.33	+ 0 14 42.3	49.4	8.982	58.45	7 20.74	15 58.99	1 4.09	12 5 5.26
23	12 1 20.06	18.91	− 0 8 41.0	33.5	8.987	58.49	7 41.65	15 59.26	1 4.11	12 9 1.81
24	12 4 55.85	54.64	0 31 65.0	57.2	8.994	58.51	8 2.41	15 59.52	1 4.13	12 12 58.37
25	12 8 31.79	30.53	− 0 55 29.4	21.2	9.002	−58.52	− 8 23.00	15 59.79	1 4.15	12 16 54.92
26	12 12 7.92	6.61	1 18 53.9	45.4	9.010	58.52	8 43.42	16 0.06	1 4.18	12 20 51.47
27	12 15 44.27	42.91	1 42 18.2	9.3	9.019	58.50	9 3.62	16 0.33	1 4.21	12 24 48.02
28	12 19 20.84	19.43	2 5 41.9	32.7	9.029	58.47	9 23.60	16 0.60	1 4.24	12 28 44.57
29	12 22 57.66	56.19	2 28 64.7	55.3	9.039	58.42	9 43.33	16 0.87	1 4.28	12 32 41.13
30	12 26 34.74	33.22	− 2 52 26.2	16.4	9.050	−58.36	−10 2.80	16 1.14	1 4.32	12 36 37.68
31	12 30 12.11	10.54	− 3 15 46.0	35.9	9.063	−58.28	−10 21.99	16 1.41	1 4.36	12 40 34.23

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 30 12.11	10.54	− 3 15 46.0	35.9	9.063	−58.28	−10 21.99	16 1.41	1 4.36	12 40 34.23
2	12 33 49.77	48.15	3 38 63.7	53.3	9.076	58.18	10 40.88	16 1.68	1 4.40	12 44 30.79
3	12 37 27.75	26.08	4 2 19.0	8.3	9.089	58.07	10 59.45	16 1.96	1 4.45	12 48 27.31
4	12 41 6.05	4.33	4 25 31.4	20.5	9.103	57.95	11 17.70	16 2.25	1 4.50	12 52 23.90
5	12 44 44.70	42.93	4 48 40.6	29.5	9.118	57.81	11 35.60	16 2.53	1 4.55	12 56 20.45
6	12 48 23.72	21.90	− 5 11 46.2	34.8	9.133	−57.65	−11 53.14	16 2.81	1 4.61	13 0 17.00
7	12 52 3.11	1.25	5 34 47.8	36.2	9.150	57.47	12 10.30	16 3.09	1 4.67	13 4 13.55
8	12 55 42.91	41.00	5 57 45.0	33.2	9.167	57.28	12 27.06	16 3.38	1 4.73	13 8 10.11
9	12 59 23.12	21.17	6 20 37.4	25.4	9.185	57.07	12 43.40	16 3.66	1 4.80	13 12 6.66
10	13 3 3.77	1.78	6 43 24.6	12.4	9.203	56.85	12 59.31	16 3.94	1 4.87	13 16 3.22
11	13 6 44.88	42.84	− 7 5 66.3	53.9	9.222	−56.60	−13 14.76	16 4.22	1 4.94	13 19 59.77
12	13 10 26.46	24.37	7 28 42.0	29.4	9.242	56.36	13 29.73	16 4.50	1 5.01	13 23 56.33
13	13 14 8.53	6.40	7 50 71.5	58.7	9.264	56.09	13 44.21	16 4.78	1 5.09	13 27 52.88
14	13 17 51.11	48.94	8 13 34.3	21.4	9.286	55.81	13 58.18	16 5.06	1 5.17	13 31 49.43
15	13 21 34.23	32.02	8 35 50.2	37.2	9.308	55.50	14 11.62	16 5.34	1 5.25	13 35 45.98
16	13 25 17.90	15.65	− 8 57 58.7	45.6	9.332	−55.19	−14 24.50	16 5.62	1 5.33	13 39 42.53
17	13 28 62.16	59.87	9 19 59.4	46.2	9.356	54.86	14 36.81	16 5.89	1 5.42	13 43 39.09
18	13 32 47.01	44.68	9 41 52.1	38.8	9.380	54.52	14 48.52	16 6.16	1 5.51	13 47 35.65
19	13 36 32.47	30.11	10 3 36.4	23.0	9.408	54.16	14 59.62	16 6.43	1 5.60	13 51 32.20
20	13 40 18.57	16.17	10 24 71.8	58.3	9.435	53.79	15 10.08	16 6.70	1 5.69	13 55 28.76
21	13 44 5.33	2.90	−10 46 38.0	24.4	9.463	−53.39	−15 19.88	16 6.96	1 5.79	13 59 25.31
22	13 47 52.77	50.31	11 7 54.7	41.0	9.491	52.99	15 29.00	16 7.23	1 5.89	14 3 21.87
23	13 51 40.91	38.42	11 28 61.6	47.8	9.520	52.57	15 37.43	16 7.49	1 5.99	14 7 18.42
24	13 55 29.75	27.24	11 49 58.1	44.4	9.550	52.14	15 45.15	16 7.75	1 6.09	14 11 14.98
25	13 59 19.31	16.78	12 10 43.9	30.2	9.580	51.69	15 52.15	16 8.01	1 6.19	14 15 11.53
26	14 3 9.62	7.06	−12 31 18.6	4.9	9.612	−51.21	−15 58.40	16 8.26	1 6.29	14 19 8.09
27	14 6 60.69	58.10	12 51 41.9	28.2	9.644	50.72	16 3.90	16 8.51	1 6.40	14 23 4.64
28	14 10 52.51	49.91	13 11 53.2	39.7	9.676	50.21	16 8.64	16 8.76	1 6.51	14 27 1.20
29	14 14 45.11	42.49	13 31 52.2	38.8	9.708	49.68	16 12.60	16 9.01	1 6.62	14 30 57.75
30	14 18 38.49	35.85	13 51 38.4	25.1	9.741	49.14	16 15.79	16 9.26	1 6.73	14 34 54.30
31	14 22 32.66	30.00	−14 10 71.4	58.2	9.774	−48.59	−16 18.19	16 9.51	1 6.84	14 38 50.86
Nov. 1	14 26 27.62	24.94	14 30 30.8	17.7	9.807	48.01	16 19.79	16 9.76	1 6.95	14 42 47.42
2	14 30 23.38	20.69	14 49 36.2	23.2	9.841	47.42	16 20.59	16 10.01	1 7.07	14 46 43.97
3	14 34 19.95	17.25	15 8 27.1	14.3	9.874	46.81	16 20.58	16 10.26	1 7.19	14 50 40.52
4	14 38 17.33	14.62	15 26 63.0	50.4	9.908	46.17	16 19.77	16 10.51	1 7.31	14 54 37.08
5	14 42 15.52	12.81	−15 45 23.6	11.2	9.941	−45.53	−16 18.14	16 10.76	1 7.43	14 58 33.64
6	14 46 14.53	11.81	16 3 28.4	16.2	9.975	44.86	16 15.70	16 11.00	1 7.55	15 2 30.19
7	14 50 14.36	11.64	16 21 17.0	5.0	10.009	44.18	16 12.44	16 11.24	1 7.67	15 6 26.74
8	14 54 15.01	12.29	16 38 49.0	37.2	10.044	43.48	16 8.35	16 11.48	1 7.79	15 10 23.30
9	14 58 16.49	13.77	16 55 64.0	52.5	10.078	42.76	16 3.43	16 11.72	1 7.91	15 14 19.86
10	15 2 18.80	16.09	−17 12 61.6	50.4	10.113	−42.03	−15 57.68	16 11.96	1 8.03	15 18 16.41
11	15 6 21.94	19.24	17 29 41.3	30.4	10.147	41.28	15 51.10	16 12.19	1 8.15	15 22 12.97
12	15 10 25.91	23.22	17 45 62.9	52.3	10.182	40.51	15 43.69	16 12.41	1 8.27	15 26 9.52
13	15 14 30.72	28.04	18 1 65.9	55.6	10.217	39.73	15 35.45	16 12.63	1 8.39	15 30 6.08
14	15 18 36.36	33.70	18 17 50.0	40.0	10.252	38.93	15 26.38	16 12.85	1 8.51	15 34 2.64
15	15 22 42.84	40.20	−18 33 14.8	5.1	10.287	−38.11	−15 16.47	16 13.06	1 8.62	15 37 59.20
16	15 26 50.16	47.55	−18 48 19.9	10.6	10.322	−37.28	−15 5.71	16 13.27	1 8.73	15 41 55.76

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 26 50.16	47.55	−18 48 19.9	10.6	10.322	−37.28	−15 5.71	16 13.27	1 8.73	15 41 55.76
17	15 30 58.32	55.74	19 2 64.9	55.9	10.357	36.44	14 54.11	16 13.47	1 8.85	15 45 52.31
18	15 35 7.32	4.77	19 17 29.5	20.8	10 392	35.58	14 41.67	16 13.67	1 8.96	15 49 48.86
19	15 39 17.16	14.64	19 31 33.4	25.0	10.427	34.71	14 28.40	16 13.87	1 9.08	15 53 45.42
20	15 43 27.83	25.34	19 45 16.2	8.1	10.461	33.83	14 14.30	16 14.07	1 9.19	15 57 41.98
21	15 47 39.31	36.86	−19 58 37.4	29.7	10.495	−32.93	−13 59.37	16 14.26	1 9.30	16 1 38.53
22	15 51 51.62	49.21	20 11 36.8	29.5	10.529	32.01	13 43.62	16 14.44	1 9.41	16 5 35.09
23	15 56 4.74	2.37	20 24 14.0	7.1	10.563	31.08	13 27.06	16 14.62	1 9.52	16 9 31.65
24	16 0 18.66	16.33	20 36 28.8	22.3	10.596	30.13	13 9.71	16 14.79	1 9.63	16 13 28.21
25	16 4 33.36	31.08	20 48 20.7	14.6	10.629	29.17	12 51.57	16 14.96	1 9.74	16 17 24.77
26	16 8 48.83	46.60	−20 59 49.4	43.6	10.660	−28.20	−12 32.66	16 15.13	1 9.84	16 21 21.33
27	16 13 5.05	2.87	21 10 54.4	48.9	10.691	27.21	12 13.00	16 15.29	1 9.94	16 25 17.88
28	16 17 21.99	19.87	21 21 35.5	30.4	10.721	26.21	11 52.61	16 15.45	1 10.04	16 29 14.44
29	16 21 39.65	37.58	21 31 52.4	47.6	10.750	25.19	11 31.51	16 15.61	1 10.13	16 33 11.00
30	16 25 58.01	56.00	21 41 44.7	40.2	10.779	24.16	11 9.71	16 15.77	1 10.22	16 37 7.55
Dec. 1	16 30 17.03	15.08	−21 51 12.1	8.0	10.806	−23.12	−10 47.25	16 15.92	1 10.31	16 41 4.11
2	16 34 36.68	34.79	22 0 14.3	10.5	10.831	22.07	10 24.16	16 16.07	1 10.40	16 45 0.67
3	16 38 56.94	55.12	22 8 51.0	47.5	10.856	21.00	10 0.46	16 16.22	1 10.48	16 48 57.23
4	16 43 17.78	16.03	22 16 62.0	58.8	10.880	19.92	9 36.17	16 16.36	1 10.56	16 52 53.79
5	16 47 39.19	37.51	22 24 46.9	44.1	10.903	18.83	9 11.31	16 16.50	1 10.64	16 56 50.35
6	16 51 61.12	59.52	−22 32 5.5	3.0	10.924	−17.73	− 8 45.93	16 16.64	1 10.71	17 0 46.90
7	16 56 23.54	22.02	22 38 57.7	55.5	10.944	16.62	8 20.06	16 16.77	1 10.78	17 4 43.46
8	17 0 46.44	45.00	22 45 23.3	21.3	10.963	15.50	7 53.72	16 16.90	1 10.84	17 8 40.02
9	17 5 9.78	8.42	22 51 22.0	20.2	10.981	14.38	7 26.93	16 17.03	1 10.90	17 12 36.58
10	17 9 33.53	32.25	22 56 53.5	52.0	10.997	13.25	6 59.73	16 17.15	1 10.96	17 16 33.13
11	17 13 57.67	56.47	−23 1 57.7	56.4	11.012	−12.11	− 6 32.15	16 17.26	1 11.01	17 20 29.69
12	17 18 22.16	21.05	23 6 34.5	33.4	11.026	10.97	6 4.21	16 17.37	1 11.06	17 24 26.25
13	17 22 46.99	45.96	23 10 43.8	42.9	11.040	9.82	5 35.93	16 17.47	1 11.11	17 28 22.81
14	17 27 12.12	11.17	23 14 25.4	24.7	11.052	8.66	5 7.35	16 17.57	1 11.15	17 32 19.37
15	17 31 37.51	36.65	23 17 39.3	38.7	11.063	7.49	4 38.50	16 17.66	1 11.19	17 36 15.93
16	17 36 3.16	2.39	−23 20 25.3	24.8	11.073	− 6.32	− 4 9.40	16 17.75	1 11.22	17 40 12.49
17	17 40 29.03	28.35	23 22 43.3	42.9	11.081	5.15	3 40.09	16 17.82	1 11.24	17 44 9.05
18	17 44 55.08	54.49	23 24 33.2	32.9	11.088	3.99	3 10.58	16 17.89	1 11.26	17 48 5.60
19	17 49 21.29	20.79	23 25 55.0	54.7	11.094	2.82	2 40.92	16 17.96	1 11.28	17 52 2.16
20	17 53 47.62	47.21	23 26 48.6	48.4	11.100	1.65	2 11.14	16 18.02	1 11.29	17 55 58.72
21	17 58 14.06	13.74	−23 27 14.0	13.9	11.103	− 0.48	− 1 41.25	16 18.08	1 11.30	17 59 55.28
22	18 2 40.56	40.34	23 27 11.2	11.2	11.105	+ 0.70	1 11.30	16 18.13	1 11.30	18 3 51.84
23	18 7 7.09	6.96	23 26 40.1	40.1	11.106	1.88	0 41.31	16 18.17	1 11.30	18 7 48.40
24	18 11 33.62	33.58	23 25 40.7	40.7	11.105	3.06	− 0 11.34	16 18.21	1 11.29	18 11 44.96
25	18 16 0.11	0.16	23 24 13.0	13.0	11.102	4.24	+ 0 18.60	16 18.25	1 11.28	18 15 41.52
26	18 20 26.52	26.67	−23 22 17.1	17.0	11.098	+ 5.42	+ 0 48.47	16 18.28	1 11.27	18 19 38.07
27	18 24 52.82	53.06	23 19 53.1	52.9	11.093	6.59	1 18.22	16 18.30	1 11.25	18 23 34.63
28	18 29 18.98	19.31	23 17 0.9	0.7	11.086	7.76	1 47.83	16 18.32	1 11.22	18 27 31.19
29	18 33 44.96	45.38	23 13 40.7	40.4	11.078	8.92	2 17.26	16 18.34	1 11.19	18 31 27.75
30	18 38 10.71	11.22	23 9 52.5	52.1	11.068	10.09	2 46.46	16 18.35	1 11.16	18 35 24.31
31	18 42 36.20	36.80	−23 5 36.4	35.9	11.056	+11.25	+ 3 15.40	16 18.36	1 11.12	18 39 20.87
32	18 47 1.39	2.08	−23 0 52.6	51.9	11.043	+12.41	+ 3 44.04	16 18.37	1 11.08	18 43 17.42

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 1	17 24.13	1.693	12 11 13.99	111.73	+ 4 14 31.1	−779.7	61.56	14 53.2	54 31.3	II. S.
2	18 4.95	1.716	12 56 6.54	113.13	− 1 2 44.4	−802.9	61.84	15 1.1	55 0.5	II. S.
3	18 46.91	1.789	13 42 7.47	117.47	− 6 24 21.0	−801.7	62.99	15 11.9	55 39.7	II. S.
4	19 31.21	1.912	14 30 29.33	124.88	−11 38 53.8	−766.1	65.15	15 25.1	56 28.3	II. S.
5	20 19.07	2.084	15 22 25.24	135.97	−16 31 20.2	−687.7	67.82	15 40.1	57 23.5	II. S.
6	21 11.51	2.291	16 18 57.01	147.50	−20 41 33.7	−552.2	70.90	15 55.8	58 21.2	II. S.
7	22 8.98	2.485	17 20 30.91	159.92	−23 44 33.8	−350.1	73.85	16 10.9	59 16.6	II. S.
8	23 10.77	2.635	18 26 25.36	168.63	−25 14 0.0	− 87.3	75.89	16 23.7	60 3.6	II. N.
10	0 14.83	2.675	19 34 35.88	170.79	−24 50 35.9	+206.2	76.39	16 32.7	60 36.7	I. N.
11	1 18.30	2.595	20 42 10.91	165.95	−22 30 58.6	488.5	75.25	16 36.8	60 51.7	I. S.
12	2 18.79	2.439	21 46 46.70	156.60	−18 30 10.3	+706.5	73.04	16 35.6	60 47.5	I. S.
13	3 15.22	2.267	22 47 18.81	146.48	−13 15 26.2	853.3	70.70	16 30.0	60 26.9	I. S.
14	4 7.82	2.125	23 43 59.63	137.63	− 7 17 9.2	928.8	68.44	16 20.8	59 52.9	I. S.
15	4 57.57	2.028	0 37 47.00	131.89	− 1 2 46.1	936.4	66.99	16 9.2	59 10.7	I. S.
16	5 45.59	1.985	1 29 55.04	129.32	+ 5 5 6.9	895.7	66.34	15 56.9	58 25.3	I. S.
17	6 33.21	1.990	2 21 36.53	129.59	+10 48 12.0	+813.0	66.42	15 44.6	57 39.9	I. S.
18	7 21.40	2.031	3 13 52.32	132.04	15 51 1.7	695.0	67.02	15 32.9	56 57.2	I. S.
19	8 10.83	2.091	4 7 23.16	135.64	19 59 58.1	544.5	67.91	15 22.5	56 18.9	I. S.
20	9 1.72	2.148	5 2 21.39	139.05	23 3 4.3	366.8	68.72	15 13.2	55 44.9	I. S.
21	9 53.70	2.177	5 58 25.37	140.86	24 51 5.7	+171.0	69.11	15 5.3	55 15.7	I. N.
22	10 45.91	2.164	6 54 42.94	140.06	+25 19 11.0	− 29.7	68.84	14 58.5	54 51.0	I. N.
23	11 37.23	2.105	7 50 7.10	136.46	24 28 15.5	−220.0	67.90	14 53.1	54 31.0	I. N.
24	12 26.67	2.012	8 43 38.44	130.88	22 24 55.0	−390.3	66.42	14 48.8	54 15.1	II. N.
25	13 13.68	1.905	9 34 42.91	124.39	19 19 50.6	−526.9	64.75	14 45.8	54 4.2	II. S.
26	13 58.17	1.806	10 23 16.25	118.47	15 25 31.9	−636.8	63.18	14 44.4	53 58.9	II. S.
27	14 40.53	1.729	11 9 41.56	113.92	+10 54 23.6	−714.2	61.97	14 44.7	54 0.1	II. S.
28	15 21.44	1.686	11 54 39.14	111.27	5 57 48.4	−764.6	61.23	14 47.1	54 8.8	II. S.
29	16 1.75	1.681	12 39 1.23	110.99	+ 0 46 2.9	−790.4	61.26	14 51.7	54 25.8	II. S.
30	16 42.47	1.720	13 23 47.76	113.35	− 4 31 10.3	−791.8	62.00	14 58.9	54 52.3	II. S.
31	17 24.70	1.807	14 10 4.83	118.58	− 9 43 39.1	−765.1	63.48	15 8.7	55 28.6	II. S.
Feb. 1	18 9.59	1.940	14 59 2.38	126.74	−14 39 17.9	−706.1	65.72	15 21.3	56 14.5	II. S.
2	18 58.29	2.120	15 51 48.49	137.55	−19 2 34.4	−601.8	68.53	15 36.0	57 8.5	II. S.
3	19 51.64	2.327	16 49 15.36	149.87	−22 33 25.7	−441.6	71.59	15 52.3	58 8.1	II. S.
4	20 49.86	2.517	17 51 34.13	161.29	−24 47 56.4	−219.5	74.33	16 8.8	59 9.0	II. N.
5	21 51.93	2.638	18 57 45.39	168.60	−25 22 35.2	+ 54.1	76.01	16 24.1	60 5.3	II. N.
6	22 55.70	2.653	20 5 38.38	169.47	−24 2 22.2	+343.1	76.16	16 36.4	60 50.4	II. N.
7	23 58.50	2.565	21 12 33.35	164.16	−20 48 32.9	613.5	74.86	16 43.9	61 17.9	II. N.
9	0 58.36	2.419	22 16 31.21	155.41	−15 59 47.9	816.3	72.75	16 45.6	61 24.0	I. N.
10	1 54.56	2.289	23 16 49.48	146.39	−10 5 54.7	938.2	70.56	16 41.3	61 8.3	I. S.
11	2 47.51	2.151	0 13 51.47	139.29	− 3 39 21.9	981.4	68.83	16 31.9	60 33.9	I. S.
12	3 38.17	2.079	1 8 36.08	134.97	+ 2 50 13.9	+956.8	67.79	16 18.8	59 45.8	I. S.
13	4 27.69	2.055	2 2 12.02	133.40	8 58 47.5	878.3	67.45	16 3.7	58 50.5	I. S.
14	5 17.11	2.071	2 55 41.77	134.33	14 27 10.8	757.5	67.72	15 48.3	57 53.6	I. S.
15	6 7.18	2.106	3 49 50.93	136.50	19 0 21.2	603.5	68.32	15 33.5	56 59.2	I. S.
16	6 58.25	2.148	4 45 0.15	139.10	+22 26 31.9	+423.9	68.91	15 19.9	56 9.5	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 16	6 58.25	2.148	4 45 0.15	139.10	+22 26 33.9	+423.9	68.91	15 19.9	56 9.5	I. S.
17	7 50.16	2.173	5 40 59.73	140.56	24 37 17.7	227.7	69.27	15 9.2	55 30.2	I. S.
18	8 42.27	2.162	6 37 11.26	139 95	25 28 4.9	+ 26.3	69.06	15 0.2	54 57.2	I. N.
19	9 33.65	2.112	7 32 39.02	136.93	24 59 17.0	−167.9	68.22	14 53.5	54 32.0	I. N.
20	10 23.40	2.029	8 26 28.81	131.94	23 16 12.6	−343.3	66.64	14 48.5	54 13.9	I. N.
21	11 10.92	1.930	9 18 4.41	125.96	+20 28 5.8	−499.1	65.20	14 45.3	54 2.3	I. N.
22	11 56.04	1.832	10 7 15.63	120.09	16 46 26.7	−610.8	63.59	14 43.8	53 56.9	I. N.
23	12 39.00	1.752	10 54 16.62	115.23	12 23 25.6	−699.3	62.26	14 43.8	53 56.8	II. N.
24	13 20.33	1.698	11 39 39.71	112.01	7 30 53.5	−758.8	61.38	14 45.3	54 2.1	II. S.
25	14 0.76	1.677	12 24 9.16	110.78	+ 2 20 2.8	−791.1	61.09	14 48.3	54 13.3	II. S.
26	14 41.18	1.696	13 8 37.06	111.91	− 2 58 27.5	−797.1	61.44	14 53.0	54 30.8	II. S.
27	15 22.52	1.756	13 54 0.80	115.51	− 8 13 52.2	−775.3	62.55	14 59.7	54 55.1	II. S.
28	16 5.80	1.858	14 41 21.50	121.65	−13 14 30.2	−722.4	64.31	15 8.4	55 27.2	II. S.
Mar. 1	16 52.04	2.002	15 31 40.31	130.31	−17 46 44.3	−631.3	66.67	15 19.1	56 6.7	II. S.
2	17 42.13	2.176	16 25 49.96	140.76	−21 33 59.3	−495.8	69.10	15 32.0	56 53.8	II. S.
3	18 36.51	2.355	17 24 18.47	151.54	−24 16 37.9	−307.7	72.15	15 46.5	57 47.1	II. S.
4	19 34.90	2.501	18 26 47.83	160 31	−25 33 42.4	− 69.1	73.66	16 1.9	58 43.8	II. N.
5	20 35.98	2.573	19 31 59.56	164.65	−25 7 41.5	+203.6	75.24	16 17.1	59 39.6	II. N.
6	21 37.72	2.555	20 37 50.43	163.58	−22 50 45.1	477.2	74.90	16 30.4	60 28.6	II. N.
7	22 38.09	2.466	21 42 19.09	158.25	−18 50 2.4	717.0	73.59	16 40.3	61 4.6	II. N.
8	23 35.87	2.348	22 44 12.24	151.15	−13 25 18.4	+893.5	71.84	16 45.1	61 22.1	II. N.
10	0 30.88	2.241	23 43 18.39	144.82	− 7 5 35.8	991.5	70.16	16 44.0	61 18.3	I. N.
11	1 23.69	2.168	0 40 12.24	140.27	− 0 22 22.0	1011.3	69.07	16 37.2	60 53.0	I. S.
12	2 15.24	2.136	1 35 50.22	138.37	+ 6 14 9.5	960.7	68.63	16 25.5	60 9.5	I. S.
13	3 6.50	2.141	2 31 10.35	138.43	12 18 29.9	852.2	68.79	16 10.7	59 15.9	I. S.
14	3 58.20	2.170	3 26 57.78	140.45	+17 29 47.8	+697.8	69.31	15 54.3	58 15.8	I. S.
15	4 50.72	2.205	4 23 33.95	142.50	21 32 24.8	510.8	69.89	15 38.1	57 16.3	I. S.
16	5 43.90	2.222	5 20 50.29	143.56	24 15 53.6	304.5	70.22	15 23.4	56 20.1	I. S.
17	6 37.13	2.206	6 18 9.22	142 61	25 35 15.3	+ 92.7	69.99	15 10.8	55 33.9	I. N.
18	7 29.49	2.148	7 14 35.80	139.21	25 31 6.8	−110.8	69.06	15 0.0	54 56.2	I. N.
19	8 20.09	2.064	8 9 16.59	133.02	+24 9 9.1	−294.8	67.62	14 52.3	54 28.2	I. N.
20	9 8.34	1.961	9 1 36.33	127.67	21 38 42.9	−452.4	65.90	14 47.4	54 9.9	I. N.
21	9 54.09	1.856	9 51 25.38	121.56	18 11 4.6	−580.7	64.08	14 44.8	54 0.3	I. N.
22	10 37.57	1.771	10 38 57.95	116.42	13 58 0.0	−679.8	62.71	14 44.3	53 58.5	I. N.
23	11 19.31	1.712	11 24 45.70	112.88	9 10 59.3	−750.7	61.93	14 45.7	54 3.3	I. N.
24	12 0.02	1.661	12 9 31.33	111.28	+ 4 1 8.2	794.1	61.28	14 48.5	54 14.0	I. N.
25	12 40.51	1.695	12 54 4.29	111.85	− 1 20 36.5	−810.0	61.38	14 52.7	54 29.6	II. N.
26	13 21.69	1.764	13 39 18.10	114.70	− 6 42 57.2	−796.7	62.21	14 58.2	54 49.8	II. S.
27	14 4.46	1.829	14 26 8.44	119.89	−11 53 39.0	−751.1	63.71	15 5.0	55 14.6	II. S.
28	14 49.76	1.951	15 15 30.03	127.27	−16 38 50.1	−668.2	65.76	15 12.9	55 43.7	II. S.
29	15 38.34	2.101	16 8 9.81	136.29	−20 42 32.9	−542.6	68.20	15 22.1	56 17.6	II. S.
30	16 30.68	2.259	17 4 34.65	145.76	−23 46 47.8	−370.2	70.69	15 32.6	56 56.0	II. S.
31	17 26.58	2.393	18 4 34.96	153.84	−25 32 55.8	−152 8	72.74	15 44.2	57 38.7	II. N.
Apr. 1	18 25.12	2.472	19 7 13.21	158 56	−25 44 52.1	+ 95.1	73.92	15 56.6	58 24.0	II. N.
2	19 24.67	2.476	20 10 52.29	158.84	−24 13 34.4	+358.3	73.96	16 8.9	59 9.5	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	19 24.67	2.476	20 10 52.29	158.84	−24 13 34.4	+358.3	73.96	16 8.9	59 9.5	II. N.
3	20 23.50	2.417	21 13 48.48	155.27	−21 0 34.7	600.9	73.04	16 20.4	59 51.7	II. N.
4	21 20.42	2.325	22 14 50.01	149.73	−16 18 26.9	800.7	71.59	16 29.5	60 25.2	II. N.
5	22 15.10	2.235	23 13 35.78	144.31	−10 28 1.8	938.9	70.20	16 35.2	60 46.2	II. N.
6	23 7.90	2.172	0 10 29.37	140.56	− 3 56 24.3	1007.8	69.18	16 36.3	60 50.3	II. N.
7	23 59.67	2.149	1 6 20.49	139.16	+ 2 48 54.6	+1006.3	68.80	16 32.5	60 36.3	II. N.
9	0 51.35	2.165	2 2 6.67	140.08	9 19 33.6	935 9	69.06	16 24.0	60 3.9	I. N.
10	1 43.78	2.207	2 58 37.07	142.67	15 9 39.1	805.1	69.77	16 11.6	59 19.2	I. S.
11	2 37.38	2.259	3 56 18.55	145.75	19 57 12.7	625.6	70.60	15 56.8	58 25.2	I. S.
12	3 32.06	2.292	4 55 4.81	147.78	23 25 47.6	413.3	71.19	15 41.2	57 28.0	I. S.
13	4 27.11	2.286	5 54 13.73	147.41	+25 25 58.0	+187.0	71.18	15 26.3	56 32.9	I. S.
14	5 21.44	2.231	6 52 38.72	144.09	25 56 2.9	− 33.9	70.38	15 12.9	55 43.6	I. N.
15	6 13.90	2.135	7 49 11.82	138.29	25 1 25.5	−234.3	68.91	15 2.0	55 3.7	I. N.
16	7 3.73	2.016	8 43 6.25	131.15	22 52 23.0	−405.2	67.02	14 53.9	54 33.8	I. N.
17	7 50.67	1.897	9 34 7.02	124.04	19 41 26.1	−544.1	65.11	14 48.7	54 14.8	I. N.
18	8 34.96	1.798	10 22 28.38	118.01	+15 41 8.2	−652.5	63.39	14 46.3	54 6.0	I. N.
19	9 17.18	1.726	11 8 45.00	117.89	11 3 8.9	−733.1	62.12	14 46.5	54 6.9	I. N.
20	9 58.10	1.690	11 53 43.47	111.87	5 58 12.1	−787.5	61.44	14 49.1	54 16.2	I. N.
21	10 38.60	1.692	12 38 16.71	111.64	+ 0 36 38.0	−816.0	61.41	14 53.5	54 32.5	I. N.
22	11 19.62	1.733	13 23 20.91	114.12	− 4 50 48.3	−816.3	62.08	14 59.4	54 54.1	I. N.
23	12 2.10	1.815	14 9 53.61	119.01	−10 12 3.8	−784.2	63.42	15 6.4	55 19.8	I. II. N. S
24	12 47.00	1.933	14 58 50.71	126.12	−15 13 2.3	−713.8	65.36	15 14.1	55 48.2	II. S.
25	13 35.07	2.078	15 50 59.94	134.90	−19 37 10.8	−599.0	67.72	15 22.3	56 18.3	II. S.
26	14 26.80	2.232	16 46 48.93	144.16	−23 5 44.2	−435.2	70.15	15 30.8	56 49.5	II. S.
27	15 22.04	2.364	17 46 8.94	151.87	−25 19 24.7	−225.4	72.22	15 39.5	57 21.3	II. S.
28	16 19.85	2.440	18 48 3.27	156.45	−26 1 46.8	+ 18.1	73.41	15 48.2	57 53.3	II. N.
29	17 18.61	2.442	19 50 55.00	156.62	−25 3 32.6	273.5	73.49	15 56.9	58 25.1	II. N.
30	18 16.58	2.379	20 52 59.36	152.99	−22 25 35.8	513.4	72.56	16 5.1	58 55.4	II. N.
May 1	19 12.54	2.279	21 53 2.61	147.13	−18 18 43.4	715.8	71.08	16 12.5	59 22.5	II. N.
2	20 6.10	2.185	22 50 41.80	141.35	−13 0 44.7	865.7	69.57	16 18.4	59 44.4	II. N.
3	20 57.65	2.117	23 46 19.89	137.24	− 6 53 31.9	+960.2	68.46	16 22.1	59 58.0	II. N.
4	21 48.05	2.091	0 40 48.70	135.65	− 0 20 35.9	994.0	68.00	16 22.9	60 0.8	II. N.
5	22 38.35	2.108	1 35 11.73	136.74	+ 6 13 25.7	965.5	68.16	16 20.2	59 51.2	II. N.
6	23 29.54	2.165	2 30 29.38	140.08	12 23 37.7	875.1	69.06	16 13.9	59 27.8	II. N.
8	0 22.40	2.241	3 27 24.70	147.14	17 45 52.5	726.6	70.22	16 4.4	58 52.9	I. S.
9	1 17.04	2.309	4 26 8.90	148.81	+21 58 40.8	+530.1	71.30	15 52.5	58 9.2	I. S.
10	2 12.97	2.342	5 26 10.44	150.74	24 46 0.0	302.9	71.85	15 39.3	57 20.6	I. S.
11	3 9.00	2.315	6 26 17.99	149.16	25 59 56.4	+ 67.7	71.53	15 26.0	56 31.8	I. S.
12	4 3.66	2.233	7 25 3.13	144.01	25 41 55.2	−153.2	70.30	15 13.7	55 46.4	I. N.
13	4 55.85	2.105	8 21 12.33	136.49	24 1 10.3	−344.1	68.42	15 3.2	55 8.1	I. N.
14	5 44.60	1.965	9 14 8.92	128.28	+21 11 18.8	−498.8	66.40	14 55.3	54 39.0	I. N.
15	6 30.31	1.845	10 3 55.61	120.87	17 26 45.9	−618.3	64.30	14 50.2	54 20.3	I. N.
16	7 13.39	1.752	10 51 4.30	115.22	13 0 43.3	−707.3	62.72	14 48.2	54 12.6	I. N.
17	7 54.67	1.691	11 36 24.01	111.83	8 4 29.9	−769.9	61.72	14 49.0	54 15.7	I. N.
18	8 35.08	1.680	12 20 52.10	112.67	+ 2 48 8.7	−808.0	61.40	14 52.5	54 28.7	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 18	8 35.08	1.680	12 20 52.10	110.94	+ 2 48 8.7	−808 0	61.40	14 52.5	54 28.7	I. N.
19	9 15.66	1.709	13 5 30.10	112.67	− 2 38 32.5	−821.4	61.83	14 58.4	54 50.3	I. N.
20	9 57.46	1.784	13 51 21.46	117.06	− 8 5 5.5	−805.9	63.00	15 6 2	55 18.8	I. N.
21	10 41.53	1.898	14 39 29.30	124.03	−13 18 28.6	−754.5	64.85	15 15.2	55 51.9	I. N.
22	11 28.82	2.051	15 30 51.12	133.13	−18 2 47.2	−658.8	67.24	15 24.8	56 27.5	I. N.
23	12 20.00	2.218	16 26 7.05	143.28	−21 58 39.6	−511.0	69.85	15 34.5	57 2.9	II. S.
24	13 15.14	2.372	17 25 21.11	152.54	−24 44 41.5	−309.8	72.20	15 43.6	57 36.3	II. S.
25	14 13.41	2.470	18 27 43.07	158.46	−26 1 5.1	− 66.0	73.70	15 51.6	58 5.9	II. S.
26	15 13.06	2.484	19 31 28.91	159.33	−25 35 9.9	+196.1	73.98	15 58.4	58 30.9	II. N.
27	16 12.04	2.418	20 34 33.90	155.28	−23 25 49.7	445.3	73.05	16 3.9	58 50.9	II. N.
28	17 8.74	2.303	21 35 21.31	148.34	−19 43 47.4	+656.1	71.38	16 7.9	59 5.8	II. N.
29	18 2.50	2.181	22 33 12.40	141.08	−14 47 43.8	814.5	69.55	16 10.6	59 15.6	II. N.
30	18 53.61	2.085	23 28 23.88	135.33	− 8 59 34.9	916.8	68.06	16 11.9	59 20.3	II. N.
31	19 42.94	2.034	0 21 48.56	132.29	− 2 41 36.7	964.0	67.23	16 11.6	59 19.4	II. N.
June 1	20 31.65	2.033	1 14 35.48	132.91	+ 3 44 25.9	957.3	67.15	16 9.6	59 12.0	II. N.
2	21 20.80	2.078	2 7 55.10	134.91	+ 9 57 0.2	+896.5	67.81	16 5.7	58 57.6	II. N.
3	22 11.68	2.158	3 2 47.12	139.71	15 34 27.5	781.5	68.99	15 59.7	58 35.6	II. N.
4	23 4.58	2.250	3 59 46.44	145.23	20 15 31.7	615 2	70.36	15 51.7	58 6.4	II. N.
5	23 59.53	2.322	4 58 48.79	149.57	23 41 13.2	406.9	71.44	15 42.2	57 31.3	I. S.
7	0 55.65	2.343	5 59 2.04	150 81	25 37 59.4	+174.6	71.77	15 31.6	56 52.4	I. S.
8	1 51.47	2.296	6 58 56.86	147.95	+26 0 52.6	− 57.8	71.11	15 20.7	56 12.7	I. S.
9	2 45.40	2.189	7 56 57.86	141.58	24 54 30.4	−268.2	69 56	15 10.5	55 34.7	I. N.
10	3 36.31	2.051	8 51 57.61	133.25	22 30 54.3	−442.7	67.47	15 1.5	55 1.9	I. N.
11	4 23.83	1.911	9 43 33.00	124.85	19 5 24.1	−578.1	65.30	14 54.6	54 36.5	I. N.
12	5 8.22	1.794	10 32 0.62	117.78	14 53 7.2	−677.8	63.26	14 50.1	54 20.1	I. N.
13	5 50.21	1.712	11 18 3.32	112.85	+10 7 12.3	−747.4	62.06	14 48.5	54 14.1	I. N.
14	6 30.73	1.672	12 2 37.61	110.46	+ 4 58 37.3	−791.8	61.36	14 49.7	54 18.7	I. N.
15	7 10.83	1.678	12 46 46.86	110.79	− 0 23 3.8	−813.0	61.45	14 54.2	54 34.9	I. N.
16	7 51.63	1.730	13 31 38.09	113.96	− 5 48 26.9	−809.7	62.30	15 1.2	55 0.7	I. N.
17	8 34.27	1.829	14 18 20.05	120.04	−11 6 46.4	−776.5	63.92	15 10.6	55 35.1	I. N.
18	9 19.88	1.978	15 8 0.84	128.83	−16 4 28.9	−704.7	66.23	15 21.7	56 15.9	I. N.
19	10 9.44	2.157	16 1 38.66	139.62	−20 24 0.7	−583.5	68.88	15 33.8	57 0.1	I. N.
20	11 3.44	2.342	16 59 44.53	150.77	−23 43 47.4	−404.5	71.76	15 45.8	57 44.4	I. N.
21	12 1.55	2.490	18 1 57.35	159.61	−25 40 42.5	−170.5	73.90	15 56.8	58 25.0	I. II. S.
22	13 2.29	2.553	19 6 47.82	163.44	−25 55 48.3	+ 98.8	74.85	16 5.9	58 58.5	II. S.
23	14 3.33	2.515	20 11 56.80	161.90	−24 21 21.1	+369.5	74.40	16 13.1	59 22.5	II. N.
24	15 2.44	2.401	21 15 10.05	154.32	−21 4 23.1	605.9	72.72	16 16.1	59 35.9	II. N.
25	15 58.35	2.258	22 15 10.22	145.65	−16 23 57.9	784.8	70.64	16 17.0	59 39.0	II. N.
26	16 50.92	2.130	23 11 49.70	137.98	−10 44 47.6	900.1	68.73	16 15.4	59 33.2	II. N.
27	17 40.88	2.043	0 5 51.87	132.75	− 4 31 53.0	954.9	67.39	16 11.9	59 20.4	II. N.
28	18 29.36	2.007	0 58 25.49	130.62	+ 1 51 48.8	+955.1	66.83	16 6.9	59 2.1	II. N.
29	19 17.62	2.094	1 50 45.90	131.60	8 5 29.1	905.2	67.06	16 0.8	58 39.7	II. N.
30	20 6.83	2.063	2 44 2.43	135.18	13 49 37.5	807.5	67.95	15 53.9	58 14.7	II. N.
July 1	20 57.81	2.169	3 39 6.56	140.35	+18 45 22.2	+663.4	69.22	15 46.3	57 46.7	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	20 57.81	2.169	3 39 6.55	140.60	+18 45 22.2	+663.4	69.23	15 46.4	57 46.7	II. N.
2	21 50.93	2.255	4 36 18.61	145.43	22 34 53.3	477.3	70.46	15 38.0	57 16.7	II. N.
3	22 45.78	2.307	5 35 15.52	148.72	25 3 15.6	260.4	71.23	15 29.6	56 45.1	II. N. S.
4	23 41.25	2.302	6 34 49.49	148.41	26 1 31.1	+ 30.7	71.13	15 20.8	56 12.8	II. S.
6	0 35.79	2.232	7 33 27.33	144.12	25 29 9.6	−188.9	70.06	15 12.1	55 40.8	I. S.
7	1 27.99	2.113	8 29 44.21	136.93	+23 34 11.2	−379.9	68.26	15 4.1	55 11.1	I. N. S.
8	2 17.02	1.974	9 22 50.95	128.60	20 30 19.5	−532.8	66.14	14 57.2	54 45.3	I. N.
9	3 2.79	1.844	10 12 41.18	120.80	16 33 15.9	−646.4	64.09	14 51.6	54 25.2	I. N.
10	3 45.75	1.742	10 59 42.36	114.65	11 57 48.1	−725.5	62.23	14 48.2	54 12.8	I. N.
11	4 26.70	1.677	11 41 42.57	110.79	6 56 35.0	−776.0	61.42	14 47.2	54 9.3	I. N.
12	5 6.62	1.660	12 28 40.64	109.50	+ 1 40 13.8	−801.8	61.09	14 49.0	54 15.8	I. N.
13	5 46.57	1.681	13 12 41.13	111.00	− 3 41 50.5	−804.6	61.54	14 53.6	54 33.0	I. N.
14	6 27.70	1.751	13 57 52.37	115.42	− 9 0 6.5	−782.2	62.78	15 1.2	55 0.9	I. N.
15	7 11.18	1.877	14 45 24.85	122.77	−14 3 28.0	−728.8	64.78	15 11.5	55 38.6	I. N.
16	7 58.15	2.044	15 36 26.96	132.80	−18 37 38.7	−634.4	67.41	15 24.1	56 24.8	I. N.
17	8 49.50	2.226	16 31 53.13	144.54	−22 24 3.9	−488.1	70.37	15 38.2	57 16.6	I. N.
18	9 45.55	2.447	17 32 1.83	155.89	−25 0 14.4	−282.8	73.12	15 52.7	58 9.9	I. N. S.
19	10 45.56	2.568	18 36 8.64	163.33	−26 3 12.0	− 24.7	74.97	16 6.4	59 0.4	I. N. S.
20	11 47.60	2.591	19 42 17.90	165.80	−25 16 32.4	+259.2	75.42	16 18.0	59 42.7	I. S.
21	12 49.15	2.522	20 47 57.67	161.60	−22 37 47.8	528.5	74.42	16 26.1	60 12.7	II. S.
22	13 48.15	2.388	21 51 3.81	153.56	−18 20 33.3	+746.8	72.50	16 30.1	60 26.9	II. N.
23	14 43.70	2.244	22 50 42.64	144.82	−12 49 43.3	895.0	70.38	16 29.5	60 25.4	II. N.
24	15 36.05	2.197	23 47 8.89	137.78	− 6 34 12.9	971.0	68.68	16 25.3	60 9.5	II. N.
25	16 26.15	2.057	0 41 19.24	133.61	− 0 1 38.8	981.8	67.61	16 17.9	59 42.6	II. N.
26	17 15.19	2.039	1 34 26.76	132.48	+ 6 23 45.8	936.6	67.37	16 8.6	59 8.4	II. N.
27	18 4.40	2.068	2 27 43.67	134.94	+12 21 8.3	+849.6	67.85	15 58.4	58 30.6	II. N.
28	18 54.74	2.131	3 22 8.95	138.07	17 32 4.7	705.2	68.80	15 47.8	57 51.6	II. N.
29	19 46.78	2.205	4 18 16.54	142.54	21 40 8.5	529.2	69.90	15 37.4	57 13.7	II. N.
30	20 40.48	2.264	5 16 3.82	146.06	24 31 26.6	323.1	70.73	15 27.6	56 37.9	II. N.
31	21 35.10	2.277	6 14 46.38	146.92	25 56 28.9	+100.8	70.91	15 19.0	56 4.7	II. N. S.
Aug. 1	22 29.36	2.233	7 13 7.93	144.94	+25 52 21.7	−119.2	70.16	15 10.4	55 34.5	II. S.
2	23 21.90	2.138	8 9 46.18	138.49	24 23 44.9	−318.8	68.61	15 3.1	55 7.4	II. S.
4	0 11.75	2.013	9 3 41.18	131.01	21 41 43.9	−484.8	66.69	14 56.7	54 43.9	II. S.
5	0 58.49	1.884	9 54 29.88	123.30	18 0 47.4	−613.3	64.62	14 51.3	54 24.5	I. N. S.
6	1 42.33	1.774	10 42 24.08	116.56	13 35 58.2	−705.0	62.84	14 47.5	54 10.5	I. N.
7	2 23.88	1.604	11 27 59.99	111.78	+ 8 41 4.3	−764.5	61.56	14 45.4	54 2.4	I. N.
8	3 3.95	1.652	12 12 7.82	109.98	+ 3 28 3.8	−796.2	60.91	14 45.2	54 1.8	I. N.
9	3 43.53	1.653	12 55 45.39	109.99	− 1 52 37.0	−808.2	60.99	14 47.4	54 9.7	I. N.
10	4 23.64	1.697	13 39 55.10	111.98	− 7 11 15.8	−785.9	61.80	14 52.1	54 27.1	I. N.
11	5 5.37	1.788	14 25 42.60	117.45	−12 17 45.0	−741.7	63.38	14 59.5	54 54.6	I. N.
12	5 49.84	1.925	15 14 14.58	126.66	−17 0 9.4	−664.9	65.64	15 9.8	55 32.2	I. N.
13	6 38.07	2.095	16 6 32.50	136.15	−21 3 27.9	−544.5	68.40	15 22.6	56 19.3	I. N.
14	7 30.74	2.290	17 3 18.19	147.68	−24 8 48.9	−373.0	71.30	15 37.5	57 13.9	I. N.
15	8 27.85	2.458	18 4 30.90	157.91	−25 54 32.8	−146.7	73.43	15 53.5	58 12.9	I. N. S.
16	9 28.34	2.588	19 9 6.24	164.10	−26 0 23.6	+122.9	75.18	16 9.4	59 11.5	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 17	10 30.13	2.567	20 15 0.80	164.42	−24 14 28.1	+405.7	75.20	16 23.6	60 3.7	I. S.
18	11 30.94	2.488	21 19 56.56	159.54	−20 39 17.7	662.3	73.99	16 34.5	60 43.5	I. S.
19	12 29.20	2.364	22 22 17.67	152.05	−15 32 27.0	859 8	72.16	16 40.5	61 5.8	II. S.
20	13 24.42	2.242	23 21 36.35	144.74	− 9 21 36.5	981.1	70.37	16 41.3	61 8.1	II. N.
21	14 17 09	2.155	0 18 21.87	139.49	− 2 37 57.3	1024.6	69.09	16 36.6	60 50.8	II. N.
22	15 8.22	2.114	1 13 34.34	137.04	+ 4 8 38.6	+997.5	68 52	16 27.6	60 17.3	II. N.
23	15 58.93	2.119	2 8 21.99	137.35	10 31 59.6	910.1	68.66	16 15.3	59 32.9	II. N.
24	16 50.23	2.160	3 3 44.74	139.81	16 10 1.9	772.6	69.33	16 1.5	58 42.4	II. N.
25	17 42.75	2.217	4 0 21.07	143.25	20 44 39.0	594.6	70.23	15 47.5	57 50.9	II. N.
26	18 36.58	2.264	4 58 16.72	146.15	24 1 44.5	386.9	70.96	15 34.2	57 1.9	II. N.
27	19 31.20	2.277	5 56 59.06	143.91	+25 52 4.6	+163.4	71.11	15 22.2	56 17.8	II. N. S.
28	20 25.52	2.239	6 55 23.86	144.61	26 12 38.5	− 58.9	70.47	15 11.8	55 39.4	II. S.
29	21 18.32	2.153	7 52 16.94	130.39	25 7 13.7	−263.9	69.08	15 3.2	55 7.7	II. S.
30	22 8.61	2.035	8 46 39.41	132.30	22 45 30.3	−439.0	67.16	14 56.1	54 41.9	II. S.
31	22 55.94	1.911	9 38 3.80	124.78	19 20 42.7	−578.8	65.11	14 50.7	54 22.2	II. S.
Sept. 1	23 40.40	1.798	10 26 34.92	118 03	+15 7 14.2	−682.8	63.25	14 46.8	54 7.7	II. S.
3	0 22.46	1.713	11 12 41.85	112.85	10 18 55.0	−753.6	61.81	14 44.5	53 58.9	I. S.
4	1 2.85	1.660	11 57 8.34	109.72	+ 5 8 18.8	−794.7	60.97	14 43.5	53 55.6	I. N.
5	1 42.42	1.644	12 40 46.02	108.78	− 0 13 14.6	−808 7	60.73	14 44.3	53 58.4	I. N.
6	2 22.12	1.671	13 24 30.91	110.54	− 5 35 13.7	−796.9	61.21	14 46.7	54 8.0	I. N.
7	3 2.91	1.737	14 9 21.62	114.52	−10 47 9.4	−758.1	62.42	14 51.5	54 25.2	I. N.
8	3 45.79	1.844	14 56 17.89	120.73	−15 37 40.2	−689.0	64.28	14 58.4	54 50.4	I. N.
9	4 31.70	1.988	15 46 16.55	129.45	−19 53 32.4	−583.8	66.68	15 7.9	55 25.3	I. N.
10	5 21.39	2.155	16 40 2.75	139.55	−23 18 55.3	−435.4	69.35	15 19.7	56 8.8	I. N.
11	6 15.15	2.391	17 37 54.02	149.54	−25 35 29.3	−239.4	71 88	15 33.7	57 0.4	I. N.
12	7 12.52	2.449	18 39 22.17	157.92	−26 24 28.6	+ 1.0	73.95	15 49.4	57 57.9	I. S.
13	8 12.15	2.505	19 43 6.25	160.61	−25 31 2.6	268.7	74.52	16 5.7	58 57.7	I. S.
14	9 12.16	2.482	20 47 13.23	159 22	−22 49 43.4	534 7	74.11	16 21.2	59 54.8	I. S.
15	10 10.86	2.401	21 50 1.33	154 41	−18 27 46.2	766.7	72.89	16 34.4	60 42.8	I. S.
16	11 7.35	2.306	22 50 36.70	148.58	−12 44 22.6	938.6	71.40	16 43.2	61 15.2	I. S.
17	12 1.67	2.227	23 49 1.09	143.78	− 6 6 54.7	+1035.6	70.17	16 46.4	61 27.4	II. S.
18	12 54.50	2.184	0 45 56.31	141.25	+ 0 53 35.6	1053.8	69.55	16 43.8	61 17 7	II. N.
19	13 46.85	2.185	1 42 22.22	141.32	7 46 6.1	996.8	69.61	16 35.6	60 47.5	II. N.
20	14 39.68	2.222	2 39 17.21	143.54	14 2 10.6	873.5	70.25	16 23.1	60 1.5	II. N.
21	15 33.66	2.277	3 37 21.54	146.87	19 17 41.4	696.3	71.32	16 7.9	59 5.8	II. N.
22	16 28.92	2.324	4 36 43.08	149.57	+23 14 2.2	+460.5	71.92	15 51.8	58 6.5	II. N.
23	17 24.94	2.335	5 36 49.61	150.36	25 39 24.6	244.7	72.12	15 36.1	57 8.9	II. N.
24	18 20.59	2.292	6 36 34.82	147.83	26 29 51.0	+ 9.2	71.49	15 21.9	56 16.7	II. N. S.
25	19 14.60	2.200	7 34 40.86	142 22	25 49 18.4	−207.5	70.04	15 9.8	55 32.4	II. S.
26	20 5.94	2.074	8 30 5.81	134.66	23 47 58.5	−393.3	68.04	15 0.1	54 56.7	II. S.
27	20 54.11	1.943	9 22 20.94	126.65	+20 39 29.6	−543.0	65.85	14 52.8	54 29.8	II. S.
28	21 39.22	1.822	10 11 31.33	119.43	16 38 20.0	−657.0	63.82	14 47.8	54 11.2	II. S.
29	22 21.75	1.729	10 58 6.81	113.89	11 58 11.4	−738.5	62.20	14 44.8	54 0.1	II. S.
30	23 2.45	1.669	11 42 51.51	110.25	6 51 28.3	−790.3	61.14	14 43.5	53 55.8	II. S.
Oct. 1	23 42.15	1.646	12 26 36.57	108.88	+ 1 29 33.0	−814 7	60.73	14 43.9	53 57.3	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	23 42.15	1.646	12 26 36.57	108.88	+ 1 29 33.0	−814.7	60.73	14 43.9	53 57.3	II. S.
3	0 21.75	1.661	13 10 16.16	109.81	− 3 56 45.2	−819.2	61.00	14 45.8	54 4.5	I. N. S.
4	1 2.19	1.715	13 54 45.67	113.04	− 9 16 28.3	−781.5	61.96	14 49.3	54 17.0	I. N.
5	1 44.38	1.806	14 41 0.16	118.53	−14 17 50.8	−720.3	63.55	14 54.3	54 35.1	I. N.
6	2 29.16	1.931	15 29 51.08	126.01	−18 47 40.2	−623.0	65.65	15 0.8	54 58.9	I. N.
7	3 17.22	2.077	16 21 59.20	134.81	−22 30 54.7	−486.2	68.06	15 9.1	55 29.4	I. N.
8	4 8.86	2.224	17 17 42.86	143.71	−25 10 56.5	−306.8	70.42	15 19.2	56 6.8	I. N.
9	5 3.79	2.344	18 16 43.81	150.94	−26 31 3.3	− 87.8	72.28	15 31.1	56 50.5	I. N. S.
10	6 0.97	2.409	19 18 0.98	154.89	−26 17 27.3	+159.3	73.26	15 44.6	57 39.9	I. S.
11	6 58.91	2.407	20 20 3.10	154.70	−24 23 3.0	412.2	73.21	15 59.0	58 32.7	I. S.
12	7 56.11	2.353	21 21 21.24	151.42	−20 50 5.8	+647.5	72.34	16 13.3	59 25.5	I. S.
13	8 51.67	2.278	22 21 0.50	146.81	−15 50 24.1	843.7	71.13	16 26.3	60 13.1	I. S.
14	9 45.46	2.210	23 18 53.44	142.84	− 9 43 30.4	981.2	70.07	16 36.4	60 50.2	I. S.
15	10 38.03	2.177	0 15 32.67	140.83	− 2 54 29.2	1051.9	69.51	16 42.0	61 11.1	I. S.
16	11 30.31	2.186	1 11 54.33	141.41	+ 4 8 5.0	1048.3	69.62	16 42.3	61 12.3	I. S.
17	12 23.32	2.235	2 9 0.28	144.44	+10 54 1.2	+968.9	70.41	16 37.1	60 52.8	II. N. S.
18	13 17.89	2.313	3 7 40.01	149.09	16 53 47.2	818.8	71.60	16 26.8	60 14.8	II. N.
19	14 14.33	2.389	4 8 12.06	153.46	21 41 17.6	610.5	72.75	16 12.6	59 23.2	II. N.
20	15 12.17	2.424	5 10 8.54	155.70	24 57 8.4	364.8	73.39	15 56.7	58 24.6	II. N.
21	16 10.17	2.398	6 12 14.78	154.11	26 31 37.5	+108.4	73.06	15 40.3	57 24.3	II. N. S.
22	17 6.70	2.304	7 12 52.68	148.44	+26 25 59.4	−131.9	71.70	15 25.0	56 28.0	II. S.
23	18 0.36	2.164	8 10 37.79	140.09	24 50 38.2	−338.1	69.57	15 11.6	55 39.1	II. S.
24	18 50.43	2.008	9 4 46.24	130.71	22 1 1.5	−503.2	67.13	15 0.9	54 59.5	II. S.
25	19 36.89	1.867	9 55 18.16	122.19	18 13 36.2	−627.9	64.80	14 52.9	54 30.3	II. S.
26	20 20.28	1.755	10 42 45.65	115.45	13 43 19.3	−717.9	62.85	14 47.4	54 11.3	II. S.
27	21 1.44	1.691	11 27 58.11	110.98	+ 8 42 59.5	−778.9	61.54	14 45.2	54 1.9	II. S.
28	21 41.29	1.646	12 11 52.18	108.93	+ 3 23 42.8	−813.2	60 89	14 45.0	54 1.2	II. S.
29	22 20.81	1.662	12 55 26.61	109.34	− 2 4 12.0	−821.9	60.95	14 46.8	54 7.6	II. S.
30	23 0.98	1.701	13 39 40.11	112.17	− 7 30 14.0	−803.4	61.72	14 50.2	54 20.2	II. S.
31	23 42.76	1.786	14 25 29.97	117.34	−12 42 47.3	−753.8	63.15	14 54.9	54 37.6	II. N. S.
Nov. 2	0 27.01	1.906	15 13 49.01	124.54	−17 28 25.8	−667.9	65.13	15 0.8	54 59.3	I. N. S.
3	1 14.44	2.049	16 5 18.91	133.09	−21 31 39.0	−540.9	67.45	15 7.7	55 24.5	I. N.
4	2 5.35	2.192	17 0 18.39	141.75	−24 35 17.1	−370.0	69.74	15 15.3	55 52.9	I. N.
5	2 59.44	2.306	17 58 29.54	148.77	−26 22 19.0	−159.2	71.59	15 23.9	56 24.6	I. N.
6	3 55.71	2.369	18 58 51.35	152.39	−26 38 58.5	+ 78.9	72.57	15 33.5	56 59.5	I. N. S.
7	4 52.62	2.362	19 59 52.22	152.01	−25 18 18.0	+323.7	72.53	15 43.8	57 37.1	I. S.
8	5 48.68	2.302	21 0 1.68	148.38	−22 22 9.9	552.6	71.65	15 54.5	58 16.6	I. S.
9	6 42.95	2.219	21 58 22 87	143.34	−18 0 40.5	748.0	70.37	16 5.4	58 56.7	I. S.
10	7 35.25	2.143	22 54 46.21	138.85	−12 29 50.4	897.9	69.19	16 15.6	59 33.9	I. S.
11	8 26.12	2.102	23 49 43.47	136.32	− 6 9 26.5	994.7	68.48	16 24.0	60 5.0	I. S.
12	9 16.53	2.106	0 44 12.95	136.59	+ 0 37 57.9	+1031.9	68.49	16 29.7	60 25.7	I. S.
13	10 7.64	2.159	1 39 24.16	139.80	7 27 14.5	1003.0	69.25	16 31.5	60 32.5	I. S.
14	11 0.52	2.252	2 36 22.75	145.41	13 50 53.7	903.3	70.65	16 29.0	60 23.0	I. S.
15	11 55.93	2.364	3 35 52.32	152.09	19 20 34.7	733.8	72.30	16 21.8	59 56.9	II. N. S.
16	12 53.83	2.456	4 37 52.71	157.41	+23 30 7.7	+ 505.6	73.67	16 10.9	59 16.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 16	12 53.83	2.456	4 37 52.71	157.41	+23 30 7.7	+505.6	73.67	16 10.9	59 16.8	II. N.
17	13 53.25	2.483	5 41 24.18	159.22	26 0 25.1	+242.7	73.81	15 57.3	58 26.6	II. N.
18	14 52.35	2.427	6 44 36.45	155.95	26 44 1.6	− 22.0	73.39	15 42.4	57 31.9	II. N. S.
19	15 49.13	2.292	7 45 29.33	147.95	25 46 33.8	−258.5	71.49	15 27.6	56 37.8	II. S.
20	16 42.21	2.125	8 42 39.29	137.72	23 23 16.5	−449.8	68.95	15 14.3	55 49.0	II. S.
21	17 31.15	1.956	9 35 40.01	127.52	+19 53 9.3	−599.9	66.34	15 3.2	55 8.2	II. S.
22	18 16.30	1.813	10 24 53.37	118.95	15 34 14 8	−695.0	63.98	14 54.9	54 37.4	II. S.
23	18 58.51	1.712	11 11 9.38	112.82	10 41 15.6	−765.2	62.24	14 49.5	54 17.5	II. S.
24	19 38.81	1.655	11 55 30.22	109.37	5 26 15.0	−803.6	61.21	14 47.1	54 8.7	II. S.
25	20 18.28	1.643	12 39 1.47	108.70	+ 0 1 20.9	−819.8	60.95	14 47.5	54 10.3	II. S.
26	20 58.01	1.677	13 22 48.83	110.72	− 5 26 34.4	−814.3	61.46	14 50.4	54 21.0	II. S.
27	21 39.09	1.754	14 7 56.75	115.37	−10 46 11.6	−779.2	62.71	14 55.4	54 39.5	II. S.
28	22 22.52	1.872	14 55 26.45	122.46	−15 45 13.3	−710.1	64.62	15 2.2	55 3.9	II. S.
29	23 9.18	2.020	15 46 10.04	131.40	−20 8 33.4	−599.2	66.96	15 9.8	55 32.4	II. S.
30	23 59.58	2.179	16 40 38.63	140.95	−23 38 20.2	−441.5	69.43	15 18.1	56 3.1	I. N.
Dec. 2	0 53.59	2.315	17 38 45.38	149.20	−25 55 29.3	−237.0	71.53	15 26.6	56 34.4	I. N.
3	1 50.29	2.393	18 39 32.46	153.93	−26 43 19.0	+ 2.1	72.77	15 35.0	57 4.9	I. N.
4	2 47.95	2.396	19 41 18.38	153.82	−25 52 14.1	252.4	72.85	15 42.9	57 34.0	I. N. S.
5	3 44.75	2.326	20 42 12.29	149.90	−23 23 0.6	488.5	71.90	15 50.4	58 1.4	I. S.
6	4 39.39	2.223	21 40 56.04	143.58	−19 26 16.5	687.8	70.36	15 57.2	58 26.7	I. S.
7	5 31.46	2.120	22 37 5.71	137 45	−14 19 2.7	+840.0	68.82	16 3.5	58 49.5	I. S.
8	6 21.43	2.051	23 31 8.36	133.15	− 8 21 3.7	941.4	67.70	16 8.9	59 9.4	I. S.
9	7 10.17	2.023	0 23 57.29	131.36	− 1 52 51.1	991.0	67.28	16 13.2	59 25.2	I. S.
10	7 58.98	2.052	1 16 50.82	133.12	+ 4 44 31.5	986.6	67.70	16 15.9	59 34.9	I. S.
11	8 49.12	2.132	2 11 3.67	138.16	11 8 41.4	924.0	68.88	16 16.3	59 36.6	I. S.
12	9 41.65	2.250	3 7 40.92	145.20	+16 55 26.1	+799.0	70.61	16 14.1	59 28.4	I. S.
13	10 37.17	2.375	4 7 17.59	152.75	21 39 29.7	611.3	72.44	16 8.8	59 9.1	I. S.
14	11 35.37	2.465	5 9 36.00	158.19	24 57 34.4	372.0	73.76	16 0.8	58 39.7	I. N.
15	12 34.90	2.479	6 13 13.75	159.00	26 33 34.6	+103.8	73.96	15 50.4	58 1.4	II. N.
16	13 33.62	2.400	7 16 3.43	154.23	26 22 7.5	−151.9	72.83	15 38.5	57 17.5	II. N. S.
17	14 29.51	2 250	8 16 2.64	145.20	+24 36 53.1	−368.5	70.66	15 26.2	56 32.1	II. S.
18	15 21.37	2.072	9 11 59.38	134.48	21 31 16.3	−545.5	67.96	15 14.2	55 48.8	II. S.
19	16 9.03	1.905	10 3 42.99	124.42	17 27 10.7	−667.3	65.37	15 4.0	55 11.2	II. S.
20	16 53.05	1.771	10 51 48.06	116.42	12 42 57.3	−747.6	63.21	14 56.0	54 41.7	II. S.
21	17 34.40	1.683	11 37 12.73	111.15	7 33 24.7	−795 0	61.75	14 50.7	54 22.1	II. S.
22	18 14.21	1.643	12 21 4.23	108.67	+ 2 10 8.5	−817.1	61.06	14 48.5	54 13.6	II. S.
23	18 53.62	1.650	13 4 32.06	109.13	− 3 17 13.3	−815.9	61.15	14 49.1	54 16.2	II. S.
24	19 33.80	1.705	13 48 45.73	112.48	− 8 39 27.9	−791.0	62.08	14 52.7	54 29.6	II. S.
25	20 15.88	1.808	14 34 53.78	118.64	−13 46 15.5	−737.6	63.75	14 59.1	54 52.9	II. S.
26	21 0.92	1.951	15 24 0.43	127.98	−18 24 45.1	−648.0	66.02	15 7.6	55 24.1	II. S.
27	21 49.78	2.122	16 16 56.42	137.50	−22 18 36.9	−513.1	68.65	15 17.7	56 1.3	II. S.
28	22 42.78	2.291	17 14 2.16	147.73	−25 8 23.1	−327.1	71.18	15 28.4	56 41.3	II. N. S.
29	23 39.43	2.416	18 14 46.61	155.29	−26 34 2.3	− 87.5	73.03	15 39.3	57 20.8	II. N.
31	0 38.19	2.464	19 17 38.83	158.10	−26 20 14.0	+204.9	73.71	15 49.2	57 57.1	I. N.
32	1 36.97	2.410	20 20 31.39	155.25	−24 22 1.3	+546.0	73.10	15 57.5	58 27.8	I. N. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	1 25.1	20 5 38.05	−20 54 52.1	9.7	3.7	0.26	Feb. 14	22 38.7	20 20 13.48	−20 18 46.1	7.8	3.0	0.21
1	1 23.4	20 7 50.05	20 33 19.5	10.0	3.8	0.27	15	22 40.5	20 25 50.35	20 7 39.5	7.8	2.9	0.21
2	1 21.0	20 9 22.64	20 12 33.6	10.4	3.9	0.28	16	22 42.2	20 31 31.75	19 55 17.0	7.7	2.9	0.21
3	1 18.0	20 10 12.64	19 52 53.7	10.8	4.0	0.29	17	22 44.0	20 37 17.32	19 41 37.8	7.6	2.9	0.20
4	1 14.1	20 10 17.24	19 34 38.4	11.1	4.1	0.29	18	22 45.9	20 43 6.74	19 26 41.5	7.5	2.8	0.20
5	1 9.4	20 9 34.31	−19 18 5.6	11.4	4.3	0.30	19	22 47.8	20 48 59.71	−19 10 27.9	7.4	2.8	0.20
6	1 4.1	20 8 2.81	19 3 31.0	11.7	4.4	0.31	20	22 49.8	20 54 55 97	18 52 56.8	7.4	2.8	0.20
7	0 57.7	20 5 42.90	18 51 7.4	12.0	4.5	0.31	21	22 51.8	21 0 55.28	18 34 8.0	7.3	2.8	0.20
8	0 50.6	20 2 36.39	18 41 3.5	12.3	4.6	0.32	22	22 53.9	21 6 57.44	18 14 1.2	7.2	2.7	0.19
9	0 42.9	19 58 46.89	18 33 23.2	12.5	4.7	0.33	23	22 56.1	21 13 2.29	17 52 36.0	7.1	2.7	0.19
10	0 34.6	19 54 19.86	−18 28 6.0	12.8	4.8	0.33	24	22 58.3	21 19 9.66	−17 29 52.6	7.1	2.7	0.19
11	0 25.7	19 49 22.54	18 25 6.8	13.0	4.9	0.34	25	23 0.5	21 25 19.42	17 5 50.7	7.0	2.7	0.19
12	0 16.4	19 44 3.61	18 24 16.5	13.2	5.0	0.34	26	23 2.7	21 31 31.45	16 40 30.4	7.0	2.7	0.19
13	0 7.0	19 38 32.77	18 25 23.8	13.3	5.0	0.34	27	23 5.0	21 37 45.66	16 13 51.8	7.0	2.6	0.19
13	23 57.5	19 33 0.07	18 28 15.2	13.3	5.1	0.34	28	23 7.3	21 44 1.97	15 45 54.7	6.9	2.6	0.18
14	23 48.3	19 27 35.31	−18 32 36.9	13.2	5.0	0.35	Mar. 1	23 9.7	21 50 20.32	−15 16 39.4	6.9	2.6	0.18
15	23 39.2	19 22 27.42	18 38 15.5	13.2	5.0	0.35	2	23 12.1	21 56 40.65	14 46 5 7	6.9	2.6	0.18
16	23 30.5	19 17 43.93	18 44 58.6	13.1	4.9	0.35	3	23 14.5	22 3 2.95	14 14 13.8	6.8	2.6	0.18
17	23 22.3	19 13 30.78	18 52 34.3	13.0	4.8	0.34	4	23 16.9	22 9 27.20	13 41 3 9	6.8	2.6	0.18
18	23 14.8	19 9 52.32	19 0 52.2	12.8	4.8	0.34	5	23 19.4	22 15 53.42	13 6 36.2	6.7	2.5	0.17
19	23 7.9	19 6 51.25	−19 9 42.4	12.6	4.7	0.33	6	23 21.9	22 22 21.61	−12 30 50 9	6.7	2.5	0.17
20	23 1.5	19 4 28.80	19 18 35.7	12.3	4.6	0.33	7	23 24.6	22 28 51.79	11 53 48.3	6.7	2.5	0.17
21	22 55.8	19 2 45.11	19 28 23.5	12.1	4.6	0.32	8	23 27.2	22 35 24.02	11 15 28.7	6.7	2.5	0.17
22	22 50.9	19 1 39.40	19 37 57.6	11.8	4.5	0.32	9	23 29.8	22 41 58.33	10 35 52.6	6.6	2.5	0.17
23	22 46.5	19 1 10.23	19 47 30.5	11.6	4.4	0.31	10	23 32.4	22 48 34.80	9 55 0.6	6.6	2.5	0.17
24	22 42.6	19 1 15.67	−19 56 54.6	11.3	4.3	0.30	11	23 35.1	22 55 13.50	− 9 12 53.3	6.6	2.5	0.17
25	22 39.3	19 1 53.62	20 6 2.8	11.0	4.2	0.29	12	23 37.8	23 1 54.51	8 29 31.3	6.6	2.5	0.17
26	22 36.4	19 3 1.82	20 14 48.9	10.8	4.1	0.29	13	23 40.6	23 8 37.90	7 44 55.5	6.5	2.5	0.17
27	22 34.1	19 4 37.93	20 23 6.6	10.5	4.0	0.28	14	23 43.4	23 15 23.76	6 59 7.1	6.5	2.5	0.16
28	22 32.2	19 6 39.71	20 30 50.5	10 3	3.9	0.28	15	23 46.2	23 22 12.20	6 12 7.4	6.5	2.5	0.16
29	22 30.7	19 9 5.00	−20 37 55.5	10.1	3.8	0.27	16	23 49.1	23 29 3.29	− 5 23 57.8	6.5	2.5	0.16
30	22 29.6	19 11 51.75	20 44 17.0	9.9	3.7	0.27	17	23 52.1	23 35 57.12	4 34 40.2	6.5	2.5	0.16
31	22 28.8	19 14 58.11	20 49 50.8	9.7	3 7	0.26	18	23 55.2	23 42 53.75	3 44 16.7	6.5	2.5	0.16
Feb. 1	22 28.2	19 18 22.33	20 54 33 1	9.5	3.6	0.26	19	23 58.2	23 49 53.22	2 52 50.0	6.5	2.5	0.16
2	22 28.0	19 22 2.77	20 58 20.4	9.3	3.5	0 25	21	0 1.3	23 56 55.57	2 0 23.2	6.5	2.5	0.16
3	22 27.9	19 25 57.97	−21 1 9.9	9.2	3.5	0.25	22	0 4.4	0 4 0.79	− 1 7 0.0	6.5	2.5	0.16
4	22 28.1	19 30 6.58	21 2 58.8	9.0	3.4	0.24	23	0 7.5	0 11 8.84	− 0 12 44.6	6.6	2.5	0.16
5	22 28.5	19 34 27.41	21 3 44.6	8.9	3.4	0.24	24	0 10.7	0 18 19.63	+ 0 42 17.8	6.6	2.5	0.17
6	22 29.1	19 38 59.38	21 3 25.3	8.7	3.3	0.24	25	0 14.0	0 25 33.01	1 38 1.5	6.6	2.5	0.17
7	22 29.9	19 43 41.45	21 1 59.1	8.6	3.3	0.23	26	0 17.3	0 32 48.75	2 34 19.7	6.7	2.5	0.17
8	22 30.8	19 48 32.73	−20 59 24.3	8.5	3.2	0.23	27	0 20.7	0 40 6.54	+ 3 31 4.7	6.7	2.5	0.17
9	22 31.8	19 53 32.42	20 55 30.5	8.4	3.2	0.23	28	0 24.0	0 47 25.98	4 28 7.7	6.8	2.5	0.17
10	22 33.0	19 58 39.77	20 50 43.4	8.3	3.2	0.22	29	0 27.4	0 54 46.56	5 25 18.9	6.8	2.6	0.17
11	22 34.3	20 3 54.13	20 44 34.9	8.2	3.1	0.22	30	0 30.8	1 2 7.65	6 22 27.5	6.9	2.6	0.18
12	22 35.7	20 9 14.90	20 37 13.1	8.0	3.1	0.22	31	0 34.2	1 9 28.54	7 19 22.1	7.0	2.6	0.18
13	22 37.2	20 14 41.51	−20 28 37.1	7.9	3.0	0.21	32	0 37.6	1 16 48.39	+ 8 15 50.0	7.0	2.7	0.18
14	22 38.7	20 20 13.48	−20 18 46.1	7.8	3.0	0.21	33	0 41.0	1 24 6.19	+ 9 11 38.0	7.1	2.7	0.18

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 37.6	1 16 48.39	+ 8 15 50.0	7.0	2.7	0.18	May 16	23 13.2	2 53 32.00	+14 13 31.3	15.5	5.8	0.41
2	0 41.0	1 24 6.19	9 11 38.0	7.1	2.7	0.18	17	23 8.2	2 52 28.16	13 54 54.0	15.3	5.8	0.40
3	0 44.3	1 31 20.89	10 6 32.4	7.2	2.8	0.18	18	23 3.5	2 51 38.47	13 38 18.9	15.1	5.7	0.39
4	0 47.5	1 38 31.34	11 0 19.4	7.3	2 8	0.19	19	22 58.9	2 51 3.71	13 23 53.7	14.9	5.7	0.39
5	0 50.5	1 45 36.29	11 52 45.4	7.5	2.9	0.19	20	22 54.7	2 50 44.44	13 11 44.0	14.7	5.6	0.38
6	0 53.6	1 52 34.43	+12 43 37.2	7.6	2.9	0.20	21	22 50.8	2 50 41.04	+13 1 53.1	14.4	5.5	0.37
7	0 56.5	1 59 24.47	13 32 42.5	7.8	3.0	0.20	22	22 47.0	2 50 53.79	12 54 22.9	14.2	5.4	0.37
8	0 59.3	2 6 5.11	14 19 49.9	7.9	3.0	0.21	23	22 43.6	2 51 22.82	12 49 14.0	13.9	5 3	0.36
9	1 1.8	2 12 35.06	15 4 48.7	8.1	3.1	0.21	24	22 40.3	2 52 8.15	12 46 25.6	13.7	5.2	0.36
10	1 4.1	2 18 53.02	15 47 30.1	8.3	3.1	0.22	25	22 37.5	2 53 9.71	12 45 55.4	13.4	5.1	0.35
11	1 6.2	2 24 57.79	+16 27 46.4	8.5	3.2	0.22	26	22 34.8	2 54 27.35	+12 47 40.3	13.2	5.0	0.34
12	1 8.1	2 30 48.26	17 5 31.2	8.7	3.2	0.23	27	22 32.4	2 56 0.92	12 51 36.6	12.9	4.9	0.33
13	1 9.8	2 36 23.33	17 40 39.6	9.0	3.3	0.24	28	22 30.3	2 57 50.19	12 57 39.8	12.7	4.8	0.33
14	1 11.2	2 41 42.02	18 13 7.7	9.2	3.4	0.24	29	22 28.4	2 59 54.95	13 5 44.9	12.5	4.7	0.32
15	1 12.2	2 46 43.40	18 42 52.5	9.5	3.5	0.25	30	22 26.9	3 2 14.97	13 15 46.6	12.1	4.6	0.31
16	1 13.0	2 51 26.65	+19 9 52.2	9.7	3.6	0.26	31	22 25.5	3 4 49.99	+13 27 39.3	11.8	4.5	0.30
17	1 13.5	2 55 50.97	19 34 5.4	10.0	3.7	0.27	June 1	22 24.4	3 7 39.79	13 41 17.0	11.6	4.4	0.30
18	1 13.6	2 59 55.66	19 55 31.6	10.3	3.8	0.28	2	22 23.5	3 10 44.15	13 56 33.8	11.3	4.3	0.29
19	1 13.4	3 3 40.08	20 14 10.3	10.6	4.0	0.28	3	22 22.9	3 14 2.89	14 13 23.6	11.1	4.2	0.29
20	1 12.9	3 7 3.67	20 30 1.7	10.9	4.1	0.29	4	22 22.6	3 17 35.84	14 31 40.1	10.8	4.1	0.28
21	1 12 0	3 10 5.96	+20 43 6.0	11.2	4.2	0.30	5	22 22.4	3 21 22.88	+14 51 17.0	10.6	4.0	0.27
22	1 10.7	3 12 46.56	20 53 23.8	11.5	4.3	0.31	6	22 22.4	3 25 23.92	15 12 8.0	10.3	4.0	0.27
23	1 9.1	3 15 5.14	21 0 55.8	11.8	4.5	0.32	7	22 22.7	3 29 38.89	15 34 6.7	10.1	3.9	0.26
24	1 7.2	3 17 1.51	21 5 42.7	12.1	4.6	0.32	8	22 23.3	3 34 7.75	15 57 6.4	9.9	3.8	0.26
25	1 4.8	3 18 35.60	21 7 45.5	12.4	4.7	0.33	9	22 24.1	3 38 50.49	16 21 0.6	9.7	3.7	0.25
26	1 2.0	3 19 47.49	+21 7 5 9	12.7	4.8	0 34	10	22 25.0	3 43 47.17	+16 45 42.3	9.5	3.6	0.25
27	0 58.9	3 20 37.39	21 3 46.0	13.0	4.9	0.35	11	22 26.3	3 48 57.86	17 11 4.7	9.3	3.6	0.24
28	0 55.4	3 21 5.71	20 57 48.1	13.4	5.0	0.36	12	22 27.7	3 54 22.64	17 37 0.7	9.1	3.5	0.24
29	0 51.6	3 21 13.02	20 49 15.6	13.7	5.2	0.36	13	22 29.5	4 0 1.61	18 3 22.7	8.9	3.4	0.23
30	0 47.5	3 21 0.12	20 38 12.7	14.0	5.3	0.37	14	22 31.4	4 5 54.91	18 30 3.1	8.7	3.3	0.23
May 1	0 43.0	3 20 28.03	+20 24 45.0	14.3	5.4	0.38	15	22 33.6	4 12 2.68	+18 56 53.6	8.5	3.2	0.23
2	0 38.2	3 19 38.03	20 8 59.7	14.6	5.5	0.39	16	22 36.0	4 18 25.03	19 23 45.4	8.4	3.2	0.22
3	0 33.2	3 18 31.56	19 51 5.0	14.8	5.6	0.39	17	22 38.7	4 25 2.10	19 50 29.6	8.2	3.1	0.22
4	0 27.9	3 17 10.31	19 31 11.3	15.1	5.6	0.40	18	22 41.5	4 31 53.99	20 16 56.9	8.1	3.1	0.21
5	0 22.4	3 15 36.15	19 9 30.9	15.3	5.7	0.40	19	22 44.7	4 39 0.73	20 42 57.2	7.9	3.0	0.21
6	0 16.8	3 13 51.16	+18 46 17.6	15.5	5.8	0.41	20	22 48.2	4 46 22.31	+21 8 19.7	7.8	3.0	0.21
7	0 10.9	3 11 57.58	18 21 46.6	15.7	5.8	0.41	21	22 51.8	4 53 58.62	21 32 53.5	7.6	2.9	0.21
8	0 5.0	3 9 57.71	17 56 15.3	15.8	5.9	0.41	22	22 55.7	5 1 49.50	21 56 26.9	7.5	2.9	0.20
8	23 59.0	3 7 53.93	17 30 2.3	15.9	5.9	0.42	23	22 59.8	5 9 54.63	22 18 47.7	7.4	2.8	0 20
9	23 53.0	3 5 48.62	17 3 26.6	16.0	6.0	0.42	24	23 4.2	5 18 13.50	22 39 44.0	7.3	2.8	0.20
10	23 47.0	3 3 44.17	+16 36 48.0	16.0	6.0	0.42	25	23 8.8	5 26 45.49	+22 59 3.3	7.2	2.7	0.20
11	23 41.0	3 1 42.83	16 10 26.6	15.9	6.0	0.42	26	23 13.6	5 35 29.84	23 16 33.4	7.1	2.7	0.20
12	23 35.2	2 59 46.76	15 44 41.6	15.9	6.0	0.42	27	23 18.5	5 44 25.53	23 32 2.4	7.0	2.6	0.19
13	23 29.5	2 57 57.92	15 19 51.2	15.8	5.9	0.41	28	23 23.6	5 53 31.37	23 45 19.2	7.0	2.6	0.19
14	23 23.8	2 56 18.16	14 56 12.6	15.7	5.9	0.41	29	23 28.9	6 2 46.01	23 56 13.7	6.9	2.6	0.19
15	23 18.5	2 54 49.06	+14 34 1.3	15.6	5.9	0.41	30	23 34 4	6 12 7.96	+24 4 36.9	6.8	2.6	0.19
16	23 13.2	2 53 32.00	+14 13 31.3	15.5	5.8	0.41	31	23 39.9	6 21 35.56	+24 10 21.4	6.8	2.6	0.19

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Semi Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	23 39.9	6 21 35.56	+24 10 21.4	6.8	2.6	0.19	Aug. 17	1 43.4	11 26 53.36	+1 19 42.7	9.8	3.6	0.24
2	23 45.4	6 31 7.10	24 13 21.6	6.8	2.6	0.19	18	1 42.5	11 29 54.57	0 48 55.6	10.0	3.7	0.25
3	23 51.0	6 40 40.80	24 13 34.4	6.7	2.5	0.19	19	1 41.5	11 32 44.56	+0 19 21.5	10.2	3.8	0.25
4	23 56.6	6 50 14.88	24 10 57.1	6.7	2.5	0.18	20	1 40.1	11 35 22.80	−0 8 53.5	10.3	3.9	0.26
6	0 2.2	6 59 47.62	24 5 30.5	6.7	2.5	0.18	21	1 38.6	11 37 48.71	0 35 42.6	10.5	3.9	0.26
7	0 7.8	7 9 17.41	+23 57 17.0	6.7	2.5	0.18	22	1 36.9	11 40 1.62	−1 0 58.4	10.7	4.0	0.27
8	0 13.3	7 18 42.72	23 46 20.5	6.7	2.5	0.18	23	1 35.0	11 42 0.84	1 24 33.1	10.9	4.1	0.27
9	0 18.6	7 28 2.17	23 32 45.9	6.7	2.5	0.18	24	1 32.8	11 43 45.65	1 46 17.9	11.1	4.2	0.28
10	0 23.8	7 37 14.60	23 16 39.8	6.7	2.5	0.18	25	1 30.4	11 45 15.25	2 6 3.7	11.3	4.3	0.28
11	0 29.0	7 46 18.98	22 58 9.9	6.7	2.5	0.18	26	1 27.6	11 46 28.81	2 23 41.0	11.5	4.4	0.29
12	0 34.0	7 55 14.45	+22 37 24.2	6.7	2.5	0.18	27	1 24.6	11 47 25.50	−2 38 59.3	11.7	4.4	0.29
13	0 38.7	8 4 0.33	22 14 31.0	6.7	2.5	0.18	28	1 21.4	11 48 4.47	2 51 47.9	11.9	4.5	0.30
14	0 43.4	8 12 36.08	21 49 39.1	6.7	2.5	0.18	29	1 17.7	11 48 24.90	3 1 55.4	12.1	4.6	0.30
15	0 47.9	8 21 1.34	21 22 57.6	6.8	2.5	0.18	30	1 13.8	11 48 26.02	3 9 10.1	12.3	4.7	0.31
16	0 52.1	8 29 15.82	20 54 35.2	6.8	2.6	0.18	31	1 9.6	11 48 7.11	3 13 20.1	12.5	4.7	0.31
17	0 56.3	8 37 19.38	+20 24 40.4	6.8	2.6	0.18	Sept. 1	1 5.0	11 47 27.62	−3 14 14.1	12.7	4.8	0.32
18	1 0.1	8 45 11.95	19 53 21.5	6.9	2.6	0.19	2	1 0.0	11 46 27.18	3 11 41.1	12.9	4.9	0.32
19	1 3.9	8 52 53.54	19 20 46.5	6.9	2.6	0.19	3	0 54.8	11 45 5.61	3 5 31.5	13.1	4.9	0.33
20	1 7.4	9 0 24.21	18 47 3.0	7.0	2.6	0.19	4	0 49.2	11 43 23.14	2 55 37.6	13.3	5.0	0.33
21	1 10.8	9 7 44.08	18 12 18.2	7.0	2.6	0.19	5	0 43.2	11 41 20.31	2 41 54.5	13.4	5.0	0.34
22	1 14.0	9 14 53.33	+17 36 38.8	7.1	2.7	0.19	6	0 36.8	11 38 58.13	−2 24 20.3	13.6	5.1	0.34
23	1 17.0	9 21 52.12	17 0 11.3	7.2	2.7	0.19	7	0 30.3	11 36 18.17	2 2 58.0	13.7	5.1	0.34
24	1 19.9	9 28 40.63	16 23 1.8	7.2	2.7	0.19	8	0 23.4	11 33 22.56	1 37 55.6	13.8	5.2	0.35
25	1 22.6	9 35 19.07	15 45 16.3	7.3	2.7	0.19	9	0 16.4	11 30 14.03	1 9 27.5	13.8	5.2	6.35
26	1 25.1	9 41 47.66	15 7 0.0	7.4	2.8	0.19	10	0 9.1	11 26 55.89	0 37 54.7	13.9	5.2	0.35
27	1 27.5	9 48 6.62	+14 28 18.0	7.4	2.8	0.19	11	0 1.8	11 23 32.07	−0 3 44.7	13.8	5.2	0.35
28	1 29.7	9 54 16.16	13 49 15.1	7.5	2.8	0.20	11	23 54.4	11 20 6.94	+0 32 28.7	13.8	5.2	0.35
29	1 31.8	10 0 16.47	13 9 56.2	7.6	2.9	0.20	12	23 47.1	11 16 45.24	1 10 6.0	13.7	5.2	0.35
30	1 33.7	10 6 7.70	12 30 25.6	7.7	2.9	0.20	13	23 40.0	11 13 31.95	1 48 23.1	13.6	5.1	0.34
31	1 35.5	10 11 50.03	11 50 47.2	7.8	2.9	0.20	14	23 33.1	11 10 32.01	2 26 33.8	13.4	5.1	0.34
Aug. 1	1 37.1	10 17 23.62	11 11 5.4	7.9	3.0	0.20	15	23 26.5	11 7 50.22	+3 3 50.7	13.2	5.0	0.33
2	1 38.5	10 22 48.59	10 31 24.1	8.0	3.0	0.21	16	23 20.2	11 5 31.04	3 39 28.2	12.9	4.9	0.33
3	1 39.8	10 28 5.05	9 51 47.1	8.0	3.0	0.21	17	23 14.4	11 3 38.43	4 12 43.1	12.6	4.8	0.32
4	1 41.0	10 33 13.08	9 12 18.0	8.1	3.1	0.21	18	23 9.1	11 2 15.67	4 42 56.6	12.3	4.7	0.31
5	1 42.1	10 38 12.72	8 33 0.7	8.2	3.1	0.21	19	23 4.3	11 1 25.38	5 9 35.5	11.9	4.5	0.31
6	1 43.0	10 43 4.00	+7 53 58.6	8.4	3.2	0.21	20	23 0.1	11 1 9.38	+5 32 12.6	11.6	4.4	0.30
7	1 43.8	10 47 46.93	7 15 15.5	8.5	3.2	0.22	21	22 56.6	11 1 28.69	5 50 27.2	11.2	4.3	0.29
8	1 44.4	10 52 21.50	6 36 55.0	8.6	3.3	0.22	22	22 53.6	11 2 23.56	6 4 4.6	10.9	4.1	0.28
9	1 44.9	10 56 47.63	5 59 1.0	8.7	3.3	0.22	23	22 51.1	11 3 53.61	6 12 56.6	10.6	4.0	0.27
10	1 45.2	11 1 5.22	5 21 37.3	8.8	3.3	0.22	24	22 49.2	11 5 57.84	6 17 0.1	10.2	3.8	0.26
11	1 45.4	11 5 14.13	+4 44 47.5	9.0	3.4	0.22	25	22 47.9	11 8 34.70	+6 16 16.6	9.9	3.7	0.26
12	1 45.5	11 9 14.21	4 8 35.6	9.1	3.4	0.23	26	22 47.1	11 11 42.21	6 10 53.0	9.6	3.6	0.25
13	1 45.4	11 13 5.25	3 33 6.1	9.3	3.5	0.23	27	22 46.8	11 15 18.07	6 0 59.2	9.3	3.5	0.24
14	1 45.1	11 16 47.00	2 58 23.4	9.4	3.5	0.23	28	22 46.8	11 19 19.77	5 46 48.2	9.0	3.4	0.23
15	1 44.8	11 20 19.17	2 24 32.0	9.5	3.5	0.23	29	22 47.3	11 23 44.66	5 28 35.8	8.8	3.3	0.23
16	1 44.2	11 23 41.41	+1 51 36.7	9.6	3.6	0.24	30	22 48.1	11 28 30.10	+5 6 39.7	8.6	3.2	0.22
17	1 43.4	11 26 53.36	+1 19 42.7	9.8	3.6	0.24	31	22 49.3	11 33 33.46	+4 41 18.5	8.4	3.1	0.21

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	22 49.3	11 33 33.46	+ 4 41 18.5	8.4	3.1	0.21	Nov. 17	0 32.8	16 18 46.64	−23 7 4.6	6.4	2.4	0.17
2	22 50.6	11 38 52.21	4 12 51.6	8.2	3.1	0.21	18	0 35.3	16 25 14.39	23 26 58.2	6.4	2.4	0.17
3	22 52.1	11 44 23.98	3 41 38.5	8.0	3.0	0.20	19	0 37.8	16 31 42.95	23 45 40.8	6.5	2.5	0.18
4	22 53.9	11 50 6.61	3 7 58.4	7.8	3.0	0.20	20	0 40.4	16 38 12.16	24 3 10.8	6.5	2.5	0.18
5	22 55.8	11 55 58.16	2 32 10.1	7.7	2.9	0.20	21	0 42.7	16 44 41.87	24 19 26.7	6.6	2.5	0.18
6	22 57.8	12 1 56.89	+ 1 54 31.3	7.5	2.9	0.19	22	0 45.4	16 51 11.89	−24 34 27.0	6.7	2.5	0.18
7	23 0.1	12 8 1.27	1 15 18.5	7.3	2.8	0.19	23	0 48.0	16 57 41.99	24 48 10.4	6.7	2.5	0.18
8	23 2.3	12 14 9.99	+ 0 34 47.1	7.2	2.8	0.19	24	0 50.6	17 4 11.91	25 0 35.5	6.8	2.6	0.19
9	23 4.5	12 20 21.98	− 0 6 48.8	7.1	2.7	0.18	25	0 53.1	17 10 41.35	25 11 40.9	6.8	2.6	0.19
10	23 6.8	12 26 36.31	0 49 16.2	7.0	2.7	0.18	26	0 55.6	17 17 9.93	25 21 25.1	6.9	2.6	0.19
11	23 9.1	12 32 52.22	− 1 32 23.7	6.9	2.7	0.18	27	0 58.1	17 23 37.23	−25 29 47.0	7.0	2.6	0.19
12	23 11.4	12 39 9.10	2 16 0.9	6.8	2.6	0.17	28	1 0.6	17 30 2.79	25 36 45.2	7.1	2.7	0.20
13	23 13.7	12 45 26.49	2 59 58.6	6.7	2.6	0.17	29	1 3.1	17 36 26.05	25 42 18.8	7.1	2.7	0.20
14	23 16.1	12 51 43.99	3 44 8.3	6.7	2.6	0.17	30	1 5.5	17 42 46.38	25 46 26.9	7.2	2.7	0.20
15	23 18.4	12 58 1.30	4 28 22.7	6.6	2.5	0.17	Dec. 1	1 7.8	17 49 3.09	25 49 8.9	7.3	2.8	0.21
16	23 20.7	13 4 18.24	− 5 12 35.4	6.6	2.5	0.16	2	1 10.0	17 55 15.36	−25 50 24.0	7.4	2.8	0.21
17	23 23.1	13 10 34.68	5 56 40.8	6.5	2.4	0.16	3	1 12.1	18 1 22.27	25 50 12.1	7.5	2.9	0.21
18	23 25.4	13 16 50.52	6 40 33.8	6.5	2.4	0.16	4	1 14.2	18 7 22.76	25 48 33.4	7.7	2.9	0.22
19	23 27.7	13 23 5.75	7 24 9.8	6.4	2.4	0.16	5	1 16.2	18 13 15.65	25 45 28.1	7.8	3.0	0.22
20	23 30.0	13 29 20.33	8 7 24.8	6.4	2.4	0.16	6	1 18.0	18 18 59.60	25 40 57.2	8.0	3.0	0.23
21	23 32.3	13 35 34.32	− 8 50 15.2	6.4	2.4	0.16	7	1 19.6	18 24 33.12	−25 35 2.0	8.1	3.1	0.23
22	23 34.6	13 41 47.75	9 32 37.9	6.3	2.4	0.16	8	1 21.0	18 29 54.46	25 27 44.6	8.3	3.2	0.23
23	23 36.8	13 48 0.69	10 14 30.2	6.3	2.4	0.16	9	1 22.2	18 35 1.69	25 19 7.6	8.5	3.2	0.24
24	23 39.1	13 54 13.21	10 55 49.2	6.3	2.4	0.16	10	1 23.2	18 39 52.66	25 9 14.4	8.7	3.3	0.24
25	23 41.4	14 0 25.40	11 36 32.6	6.3	2.3	0.16	11	1 23.8	18 44 24.96	24 58 9.1	8.9	3.3	0.25
26	23 43.6	14 6 37.39	−12 16 38.5	6.2	2.3	0.16	12	1 23.9	18 48 35.92	−24 45 56.8	9.1	3.4	0.25
27	23 45.8	14 12 49.29	12 56 4.7	6.2	2.3	0.16	13	1 23.7	18 52 22.58	24 32 43.8	9.3	3.5	0.26
28	23 48.1	14 19 1.18	13 34 49.4	6.2	2.3	0.16	14	1 23.1	18 55 41.71	24 18 37.2	9.6	3.6	0.26
29	23 50.4	14 25 13.16	14 12 51.0	6.2	2.3	0.16	15	1 22.0	18 58 29.95	24 3 44.5	9.8	3.7	0.27
30	23 52.6	14 31 25.38	14 50 7.9	6.1	2.3	0.16	16	1 20.3	19 0 43.70	23 48 14.7	10.1	3.8	0.27
31	23 54.9	14 37 37.92	−15 26 38.6	6.1	2.3	0.16	17	1 18.0	19 2 19.31	−23 32 17.4	10.4	3.9	0.28
Nov. 1	23 57.1	14 43 50.89	16 2 21.4	6.1	2.3	0.16	18	1 14.8	19 3 13.18	23 16 2.6	10.7	4.0	0.29
2	23 59.4	14 50 4.38	16 37 14.9	6.1	2.3	0.16	19	1 11.1	19 3 22.06	22 59 40.3	11.0	4.1	0.29
4	0 1.7	14 56 18.49	17 11 17.8	6.1	2.3	0.16	20	1 6.6	19 2 43.22	22 43 20.6	11.3	4.3	0.30
5	0 4.0	15 2 33.31	17 44 28.9	6.1	2.3	0.16	21	1 1.2	19 1 14.82	22 27 12.9	11.6	4.4	0.31
6	0 6.3	15 8 48.91	−18 16 46.7	6.2	2.3	0.16	22	0 54.9	18 58 56.27	−22 11 25.3	11.9	4.5	0.32
7	0 8.6	15 15 5.37	18 48 9.9	6.2	2.3	0.16	23	0 48.0	18 55 48.60	21 56 5.5	12.1	4.6	0.32
8	0 11.0	15 21 22.77	19 18 37.1	6.2	2.3	0.16	24	0 40.1	18 51 54.81	21 41 20.4	12.3	4.7	0.33
9	0 13.3	15 27 41.15	19 48 7.1	6.2	2.3	0.16	25	0 31.5	18 47 20.01	21 27 16.0	12.6	4.8	0.34
10	0 15.7	15 34 0.57	20 16 38.4	6.2	2.3	0.17	26	0 22.5	18 42 11.48	21 13 58.7	12.8	4.8	0.34
11	0 18.1	15 40 21.06	−20 44 9.9	6.2	2.3	0.17	27	0 13.1	18 36 38.39	−21 1 35.7	13.0	4.9	0.35
12	0 20.5	15 46 42.62	21 10 40.2	6.2	2.4	0.17	28	0 3.3	18 30 51.23	20 50 15.0	13.1	4.9	0.35
13	0 22.9	15 53 5.29	21 36 7.8	6.3	2.4	0.17	28	23 53.6	18 25 1.27	20 40 6.2	13.2	5.0	0.35
14	0 25.3	15 59 29.06	22 0 31.4	6.3	2.4	0.17	29	23 44.1	18 19 19.53	20 31 19.4	13.1	5.0	0.35
15	0 27.8	16 5 53.91	22 23 49.8	6.3	2.4	0.17	30	23 34.8	18 13 56.20	20 24 4.4	13.0	4.9	0.35
16	0 30.4	16 12 19.79	−22 46 1.3	6.4	2.4	0.17	31	23 25.9	18 8 59.92	−20 18 29.9	12.9	4.9	0.35
17	0 32.8	16 18 46.64	−23 7 4.6	6.4	2.4	0.17	32	23 17.5	18 4 37.47	−20 14 41.5	12.7	4.8	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	21 34.4	16 18 8.99	−16 49 13.7	24.2	23.4	1.63	Feb. 15	21 1.4	18 46 26.24	−19 53 39.5	12.7	12.3	0.87
1	21 31.8	16 19 29.47	16 48 50.5	23.9	23.0	1.60	16	21 1.8	18 50 49.52	19 53 11.1	12.5	12.1	0.86
2	21 29.3	16 20 57.69	16 49 8.4	23.5	22.6	1.58	17	21 2.3	18 55 14.18	19 52 15.5	12.4	12.0	0.85
3	21 26.9	16 22 33.42	16 50 5.3	23.1	22.3	1.55	18	21 2.8	18 59 40.14	19 50 52.3	12.2	11.8	0.84
4	21 24.8	16 24 16.42	16 51 38.8	22.7	21.9	1.53	19	21 3.3	19 4 7.35	19 49 0.9	12.1	11.7	0.83
5	21 22.7	16 26 6.43	−16 53 46.5	22.3	21.6	1.50	20	21 3.8	19 8 35.73	−19 46 40.9	12.0	11.6	0.82
6	21 20.6	16 28 3.21	16 56 25.9	21.9	21.2	1.48	21	21 4.3	19 13 5.22	19 43 52.1	11.8	11.4	0.81
7	21 18.7	16 30 6.54	16 59 34.8	21.6	20.9	1.45	22	21 4.8	19 17 35.74	19 40 33.9	11.7	11.3	0.81
8	21 16.9	16 32 16.19	17 3 10.7	21.2	20.6	1.43	23	21 5.4	19 22 7.22	19 36 46.1	11.6	11.2	0.80
9	21 15.3	16 34 31.95	17 7 11.4	20.9	20.2	1.41	24	21 6.0	19 26 39.61	19 32 28.5	11.5	11.1	0.79
10	21 13.7	16 36 53.61	−17 11 34.8	20.6	19.9	1.39	25	21 6.6	19 31 12.84	−19 27 40.8	11.4	11.0	0.78
11	21 12.2	16 39 20.97	17 16 18.5	20.3	19.6	1.37	26	21 7.2	19 35 46.84	19 22 22.8	11.3	10.9	0.77
12	21 10.8	16 41 53.83	17 21 20.5	20.0	19.3	1.35	27	21 7.9	19 40 21.52	19 16 34.4	11.2	10.8	0.77
13	21 9.5	16 44 32.01	17 26 38.5	19.6	19.0	1.33	28	21 8.5	19 44 56.83	19 10 15.3	11.1	10.7	0.76
14	21 8.2	16 47 15.33	17 32 10.6	19.3	18.7	1.31	Mar. 1	21 9.2	19 49 32.70	19 3 25.5	11.0	10.6	0.75
15	21 7.1	16 50 3.63	−17 37 54.8	19.0	18.4	1.29	2	21 9.9	19 54 9.07	−18 56 4.7	10.9	10.5	0.74
16	21 6.1	16 52 56.74	17 43 49.3	18.7	18.1	1.27	3	21 10.6	19 58 45.86	18 48 13.0	10.8	10.4	0.74
17	21 5.1	16 55 54.51	17 49 52.2	18.4	17.8	1.25	4	21 11.3	20 3 23.02	18 39 50.3	10.7	10.3	0.73
18	21 4.2	16 58 56.80	17 56 1.7	18.1	17.6	1.24	5	21 12.0	20 8 0.49	18 30 56.8	10.6	10.2	0.72
19	21 3.4	17 2 3.47	18 2 16.0	17.9	17.3	1.22	6	21 12.7	20 12 38.20	18 21 32.7	10.5	10.1	0.71
20	21 2.7	17 5 14.36	−18 8 33.3	17.6	17.0	1.20	7	21 13.3	20 17 16.10	−18 11 38.0	10.4	10.0	0.71
21	21 2.0	17 8 29.35	18 14 52.1	17.4	16.8	1.18	8	21 14.0	20 21 54.14	18 1 12.9	10.3	9.9	0.70
22	21 1.4	17 11 48.32	18 21 10.8	17.1	16.5	1.17	9	21 14.6	20 26 32.25	17 50 17.5	10.2	9.8	0.69
23	21 0.8	17 15 11.16	18 27 27.7	16.9	16.3	1.15	10	21 15.3	20 31 10.38	17 38 52.0	10.1	9.8	0.69
24	21 0.3	17 18 37.74	18 33 41.2	16.6	16.1	1.14	11	21 16.0	20 35 48.50	17 26 56.6	10.0	9.7	0.68
25	20 59.8	17 22 7.94	−18 39 49.8	16.4	15.9	1.12	12	21 16.7	20 40 26.55	−17 14 31.4	9.9	9.6	0.67
26	20 59.4	17 25 41.65	18 45 52.2	16.2	15.7	1.11	13	21 17.3	20 45 4.49	17 1 36.9	9.8	9.5	0.67
27	20 59.1	17 29 18.75	18 51 46.8	16.0	15.5	1.09	14	21 18.0	20 49 42.29	16 48 13.3	9.7	9.4	0.66
28	20 56.9	17 32 59.12	18 57 32.4	15.8	15.2	1.08	15	21 18.7	20 54 19.91	16 34 20.8	9.7	9.4	0.65
29	20 58.7	17 36 42.66	19 3 7.5	15.6	15.0	1.06	16	21 19.4	20 58 57.32	16 19 59.8	9.6	9.3	0.65
30	20 58.5	17 40 29.26	−19 8 30.9	15.4	14.8	1.05	17	21 20.1	21 3 34.49	−16 5 10.7	9.5	9.2	0.64
31	20 58.3	17 44 18.81	19 13 41.2	15.2	14.6	1.04	18	21 20.8	21 8 11.39	15 49 53.7	9.5	9.1	0.63
Feb. 1	20 58.2	17 48 11.20	19 18 37.5	15.0	14.4	1.02	19	21 21.4	21 12 47.99	15 34 9.6	9.4	9.1	0.63
2	20 58.2	17 52 6.31	19 23 18.5	14.8	14.3	1.01	20	21 22.1	21 17 24.29	15 17 58.0	9.3	9.0	0.62
3	20 58.2	17 56 4.05	19 27 43.1	14.6	14.1	0.99	21	21 22.7	21 22 0.25	15 1 19.9	9.3	8.9	0.62
4	20 58.3	18 0 4.30	−19 31 50.2	14.4	13.9	0.98	22	21 23.4	21 26 35.86	−14 44 15.5	9.2	8.9	0.61
5	20 58.4	18 4 6.98	19 35 38.9	14.2	13.7	0.97	23	21 24.0	21 31 11.09	14 26 45.2	9.1	8.8	0.60
6	20 58.5	18 8 11.98	19 39 8.1	14.0	13.6	0.96	24	21 24.7	21 35 45.94	14 8 49.5	9.1	8.7	0.60
7	20 58.7	18 12 19.21	19 42 16.9	13.8	13.4	0.94	25	21 25.3	21 40 20.39	13 50 29.0	9.0	8.7	0.59
8	20 59.0	18 16 28.57	19 45 4.4	13.7	13.3	0.93	26	21 26.0	21 44 54.44	13 31 44.0	8.9	8.6	0.59
9	20 59.3	18 20 39.97	−19 47 30.0	13.5	13.1	0.92	27	21 26.6	21 49 28.09	−13 12 35.0	6.9	8.5	0.58
10	20 59.6	18 24 53.31	19 49 32.8	13.3	13.0	0.91	28	21 27.2	21 54 1.31	12 53 2.4	8.8	8.5	0.58
11	20 59.9	18 29 8.51	19 51 12.0	13.2	12.8	0.90	29	21 27.8	21 58 34.08	12 33 6.9	8.7	8.4	0.57
12	21 0.2	18 33 25.49	19 52 26.8	13.0	12.7	0.90	30	21 28.4	22 3 6.42	12 12 48.9	8.7	8.3	0.57
13	21 0.6	18 37 44.16	19 53 16.8	12.9	12.6	0.89	31	21 20.0	22 7 38.29	11 52 8.9	8.6	8.3	0.56
14	21 1.0	18 42 4.43	−19 53 41.2	12.8	12.4	0.88	32	21 29.6	22 12 9.71	−11 31 7.6	8.5	8.2	0.56
15	21 1.4	18 46 26.24	−19 53 39.5	12.7	12.3	0.87	33	21 30.1	22 16 40.67	−11 9 45.4	8.5	8.2	0.55

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	21 29.6	22 12 9.71	−11 31 7.6	8.5	8.2	0.56
2	21 30.1	22 16 40.67	11 9 45.4	8.5	8.2	0.55
3	21 30.7	22 21 11.19	10 48 3.1	8.4	8.1	0.55
4	21 31.2	22 25 41.24	10 26 1.2	8.4	8.1	0.54
5	21 31.8	22 30 10.84	10 3 40.2	8.3	8.0	0.54
6	21 32.3	22 34 39.98	− 9 41 0.8	8.2	8.0	0.54
7	21 32.9	22 39 8.67	9 18 3.5	8.2	7.9	0.53
8	21 33.4	22 43 36.92	8 54 49.1	8.1	7.8	0.53
9	21 33.9	22 48 4.74	8 31 18.2	8.1	7.8	0.53
10	21 34.4	22 52 32.14	8 7 31.3	8.0	7.7	0.52
11	21 35.0	22 56 59.13	− 7 43 29.0	8.0	7.7	0.52
12	21 35.5	23 1 25.72	7 19 12.0	7.9	7.6	0.51
13	21 36.0	23 5 51.92	6 54 40.9	7.9	7.6	0.51
14	21 36.5	23 10 17.76	6 29 56.4	7.8	7.5	0.51
15	21 37.0	23 14 43.26	6 4 59.2	7.8	7.5	0.50
16	21 37.4	23 19 8.45	− 5 39 49.7	7.8	7.5	0.50
17	21 37.9	23 23 33.35	5 14 28.5	7.7	7.4	0.50
18	21 38.3	23 27 57.98	4 48 56.3	7.7	7.4	0.49
19	21 38.8	23 32 22.37	4 23 13.7	7.6	7.3	0.49
20	21 39.2	23 36 46.55	3 57 21.3	7.6	7.3	0.49
21	21 39.7	23 41 10.54	− 3 31 19.7	7.5	7.3	0.49
22	21 40.1	23 45 34.37	3 5 9.5	7.5	7.2	0.48
23	21 40.6	23 49 58.07	2 38 51.4	7.4	7.2	0.48
24	21 41.1	23 54 21.66	2 12 26.0	7.4	7.1	0.48
25	21 41.6	23 58 45.18	1 45 54.0	7.3	7.1	0.47
26	21 42.1	0 3 8.66	− 1 19 15.8	7.3	7.1	0.47
27	21 42.6	0 7 32.12	0 52 32.4	7.3	7.0	0.47
28	21 43.0	0 11 55.60	− 0 25 44.2	7.2	7.0	0.46
29	21 43.4	0 16 19.12	+ 0 1 8.1	7.2	7.0	0.46
30	21 43.8	0 20 42.71	0 28 3.7	7.1	6.9	0.46
May 1	21 44.2	0 25 6.39	+ 0 55 2.2	7.1	6.9	0.46
2	21 44.7	0 29 30.21	1 22 2.9	7.1	6.8	0.46
3	21 45.2	0 33 54.18	1 49 5.1	7.0	6.8	0.45
4	21 45.6	0 38 18.35	2 16 8.0	7.0	6.8	0.45
5	21 46.1	0 42 42.74	2 43 11.0	7.0	6.7	0.45
6	21 46.6	0 47 7.37	+ 3 10 13.4	6.9	6.7	0.45
7	21 47.1	0 51 32.28	3 37 14.6	6.9	6.7	0.45
8	21 47.5	0 55 57.49	4 4 14.0	6.9	6.6	0.44
9	21 48.0	1 0 23.03	4 31 10.9	6.8	6.6	0.44
10	21 48.5	1 4 48.94	4 58 4.5	6.8	6.6	0.44
11	21 49.0	1 9 15.25	+ 5 24 54.1	6.8	6.5	0.44
12	21 49.5	1 13 41.99	5 51 38.9	6.7	6.5	0.44
13	21 50.0	1 18 9.21	6 18 18.4	6.7	6.5	0.44
14	21 50.5	1 22 36.92	6 44 51.8	6.7	6.4	0.43
15	21 51.0	1 27 5.16	7 11 18.7	6.6	6.4	0.43
16	21 51.5	1 31 33.96	+ 7 37 38.4	6.6	6.4	0.43
17	21 52.0	1 36 3.35	+ 8 3 50.3	6.6	6.4	0.43
May 17	21 52.0	1 36 3.35	+ 8 3 50.3	6.6	6.4	0.43
18	21 52.6	1 40 33.37	8 29 53.4	6.5	6.3	0.43
19	21 53.1	1 45 4.05	8 55 47.1	6.5	6.3	0.43
20	21 53.7	1 49 35.43	9 21 31.0	6.5	6.3	0.42
21	21 54.3	1 54 7.54	9 47 4.1	6.5	6.3	0.42
22	21 54.9	1 58 40.41	+10 12 26.1	6.4	6.2	0.42
23	21 55.5	2 3 14.06	10 37 36.1	6.4	6.2	0.42
24	21 56.1	2 7 48.53	11 2 33.4	6.4	6.2	0.42
25	21 56.7	2 12 23.85	11 27 17.4	6.4	6.2	0.42
26	21 57.4	2 17 0.05	11 51 47.4	6.3	6.1	0.42
27	21 58.1	2 21 37.15	+12 16 2.6	6.3	6.1	0.42
28	21 58.8	2 26 15.17	12 40 2.3	6.3	6.1	0.41
29	21 59.5	2 30 54.14	13 3 45.9	6.2	6.0	0.41
30	22 0.2	2 35 34.08	13 27 12.8	6.2	6.0	0.41
31	22 1.0	2 40 15.00	13 50 22.1	6.2	6.0	0.41
June 1	22 1.8	2 44 56.94	+14 13 13.2	6.2	6.0	0.41
2	22 2.6	2 49 39.90	14 35 45.2	6.1	6.0	0.41
3	22 3.4	2 54 23.91	14 57 57.5	6.1	5.9	0.41
4	22 4.2	2 59 8.96	15 19 49.3	6.1	5.9	0.41
5	22 5.0	3 3 55.08	15 41 20.0	6.1	5.9	0.41
6	22 5.8	3 8 42.26	+16 2 28.7	6.1	5.9	0.41
7	22 6.7	3 13 30.53	16 23 14.9	6.0	5.9	0.41
8	22 7.6	3 18 19.88	16 43 37.7	6.0	5.8	0.41
9	22 8.5	3 23 10.34	17 3 36.6	6.0	5.8	0.40
10	22 9.4	3 28 1.90	17 23 11.0	6.0	5.8	0.40
11	22 10.3	3 32 54.58	+17 42 20.0	6.0	5.8	0.40
12	22 11.2	3 37 48.36	18 1 3.1	5.9	5.8	0.40
13	22 12.2	3 42 43.25	18 19 19.3	5.9	5.8	0.40
14	22 13.2	3 47 39.26	18 37 8.1	5.9	5.7	0.40
15	22 14.2	3 52 36.38	18 54 28.8	5.9	5.7	0.40
16	22 15.2	3 57 34.61	+19 11 20.9	5.9	5.7	0.40
17	22 16.3	4 2 33.93	19 27 43.7	5.8	5.7	0.40
18	22 17.3	4 7 34.33	19 43 36.5	5.8	5.7	0.40
19	22 18.4	4 12 35.84	19 58 58.8	5.8	5.6	0.40
20	22 19.5	4 17 38.43	20 13 50.0	5.8	5.6	0.40
21	22 20.6	4 22 42.08	+20 28 9.3	5.8	5.6	0.40
22	22 21.7	4 27 46.78	20 41 56.2	5.8	5.6	0.40
23	22 22.9	4 32 52.49	20 55 10.3	5.7	5.6	0.40
24	22 24.1	4 37 59.19	21 7 51.0	5.7	5.6	0.40
25	22 25.3	4 43 6.87	21 19 57.5	5.7	5.5	0.40
26	22 26.5	4 48 15.50	+21 31 29.5	5.7	5.5	0.40
27	22 27.7	4 53 25.07	21 42 26.3	5.7	5.5	0.39
28	22 28.9	4 58 35.53	21 52 47.4	5.7	5.5	0.39
29	22 30.1	5 3 46.86	22 2 32.4	5.6	5.5	0.39
30	22 31.3	5 8 59.00	22 11 40.9	5.6	5.5	0.39
31	22 32.6	5 14 11.93	+22 20 12.2	5.6	5.5	0.39
32	22 33.9	5 19 25.59	+22 28 6.0	5.6	5.4	0.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 32.6	5 14 11.93	+22 20 12.2	5.6	5.5	0.39	Aug. 16	23 31.1	9 14 13.77	+17 8 2.4	5.2	5.0	0.35
2	22 33.9	5 19 25.59	22 28 6.0	5.6	5.4	0.39	17	23 32.1	9 19 11.21	16 47 11.7	5.2	5.0	0.35
3	22 35.2	5 24 39.95	22 35 22.0	5.6	5.4	0.39	18	23 33.1	9 24 7.62	16 25 52.7	5.2	5.0	0.35
4	22 36.5	5 29 54.95	22 41 59.6	5.6	5.4	0.39	19	23 34.1	9 29 3.00	16 4 6.2	5.2	5.0	0.35
5	22 37.8	5 35 10.55	22 47 58.7	5.6	5.4	0.39	20	23 35.1	9 33 57.35	15 41 52.7	5.2	5.0	0.35
6	22 39.1	5 40 26.71	+22 53 18.7	5.5	5.4	0.39	21	23 36.0	9 38 50.69	+15 19 12.8	5.2	5.0	0.35
7	22 40.5	5 45 43.39	22 57 59.6	5.5	5.4	0.39	22	23 37.0	9 43 43 03	14 56 7.4	5.2	5.0	0.35
8	22 41.8	5 51 0.52	23 2 0.9	5.5	5.3	0.39	23	23 37.9	9 48 34.37	14 32 37.1	5.2	5.0	0.34
9	22 43.2	5 56 18.04	23 5 22.4	5.5	5.3	0.39	24	23 38.8	9 53 24.75	14 8 42.5	5.2	5.0	0.34
10	22 44.5	6 1 35.91	23 8 3.7	5.5	5.3	0.39	25	23 39.7	9 58 14.16	13 44 24.3	5.2	5.0	0.34
11	22 45.9	6 6 54.07	+23 10 4.9	5.5	5.3	0.38	26	23 40.5	10 3 2.62	+13 19 43.3	5.2	5.0	0.34
12	22 47.2	6 12 12.47	23 11 25.8	5.5	5.3	0.38	27	23 41.4	10 7 50.15	12 54 40.2	5.2	5.0	0.34
13	22 48.6	6 17 31.07	23 12 6.3	5.5	5.3	0.38	28	23 42.2	10 12 36.77	12 29 15.6	5.2	5.0	0.34
14	22 50.0	6 22 49.80	23 12 6.0	5.5	5.3	0.38	29	23 43.0	10 17 22.49	12 3 30.2	5.2	5.0	0.34
15	22 51.4	6 28 8.61	23 11 24.9	5.4	5.3	0.38	30	23 43.8	10 22 7.34	11 37 24.8	5.2	5.0	0.34
16	22 52.8	6 33 27.46	+23 10 3.1	5.4	5.2	0.38	31	23 44.6	10 26 51.35	+11 11 0.1	5.2	5.0	0.34
17	22 54.1	6 38 46.29	23 8 0.7	5.4	5.2	0.38	Sept. 1	23 45.4	10 31 34.54	10 44 16 8	5.2	5.0	0.34
18	22 55.5	6 44 5.04	23 5 17.6	5.4	5.2	0.38	2	23 46.2	10 36 16.92	10 17 15.7	5.2	5.0	0.34
19	22 56.8	6 49 23.69	23 1 53.8	5.4	5.2	0.38	3	23 46.9	10 40 58.53	9 49 57.6	5.1	5.0	0.34
20	22 58.2	6 54 42.13	22 57 49.4	5.4	5.2	0.38	4	23 47.7	10 45 39.38	9 22 23.2	5.1	5.0	0.34
21	22 59.5	7 0 0.36	+22 53 4.4	5.4	5.2	0.38	5	23 48.3	10 50 19.52	+ 8 54 33.3	5.1	5.0	0.34
22	23 0.9	7 5 18.31	22 47 39.1	5.4	5.2	0.38	6	23 49.0	10 54 58.98	8 26 28.6	5.1	5.0	0.33
23	23 2.2	7 10 35.94	22 41 33.5	5.4	5.2	0.38	7	23 49.7	10 59 37.78	7 58 9.7	5.1	5.0	0.33
24	23 3.6	7 15 53.20	22 34 47.9	5.4	5.2	0.37	8	23 50.4	11 4 15.95	7 29 37.5	5.1	5.0	0.33
25	23 4.9	7 21 10.03	22 27 22.3	5.3	5.2	0.37	9	23 51.1	11 8 53.52	7 0 52.7	5.1	5.0	0.33
26	23 6.2	7 26 26.40	+22 19 17.0	5.3	5.2	0.37	10	23 51.8	11 13 30.53	+ 6 31 56.0	5.1	5.0	0.33
27	23 7.5	7 31 42.24	22 10 32.4	5.3	5.1	0.37	11	23 52.4	11 18 7.02	6 2 48.1	5.1	5.0	0.33
28	23 8.8	7 36 57.53	22 1 8.7	5.3	5.1	0.37	12	23 53.1	11 22 43.03	5 33 29.8	5.1	5.0	0.33
29	23 10.1	7 42 12.21	21 51 6.1	5.3	5.1	0.37	13	23 53.7	11 27 18.59	5 4 1.8	5.1	5.0	0.33
30	23 11.4	7 47 26.24	21 40 25.1	5.3	5.1	0.37	14	23 54.4	11 31 53.74	4 34 24.7	5.1	5.0	0.33
31	23 12.7	7 52 39.59	+21 29 5.9	5.3	5.1	0.37	15	23 55.0	11 36 28.53	+ 4 4 39.5	5.1	5.0	0.33
Aug. 1	23 14.0	7 57 52.20	21 17 9.1	5.3	5.1	0.37	16	23 55 7	11 41 3.00	3 34 46.8	5.1	5.0	0.33
2	23 15.2	8 3 4.05	21 4 34.9	5.3	5 1	0.36	17	23 56.3	11 45 37.17	3 4 47.2	5.1	5.0	0.33
3	23 16.5	8 8 15.09	20 51 24.0	5.3	5.1	0.36	18	23 56.9	11 50 11.11	2 34 41.6	5.1	5.0	0.33
4	23 17.7	8 13 25.29	20 37 36.7	5.3	5.1	0.36	19	23 57.5	11 54 44.85	2 4 30.5	5.1	5.0	0.33
5	23 18.9	8 18 34.63	+20 23 13.4	5.3	5.1	0.36	20	23 58.1	11 59 18.44	+ 1 34 14.8	5.1	5.0	0.33
6	23 20.1	8 23 43.08	20 8 14.7	5.3	5.1	0.36	21	23 58.7	12 3 51.92	1 3 55.1	5.1	5.0	0.33
7	23 21.3	8 28 50.60	19 52 41.2	5.2	5.1	0.36	22	23 59.3	12 8 25.32	0 33 32.2	5.1	5.0	0.33
8	23 22.5	8 33 57.18	19 36 33.3	5.2	5.1	0.36	24	0 0.0	12 12 58 68	+ 0 3 6.8	5.1	5.0	0.33
9	23 23.6	8 39 2.78	19 19 51.6	5.2	5.1	0.36	25	0 0.6	12 17 32.06	− 0 27 20.4	5.1	5.0	0.33
10	23 24.7	8 44 7.40	+19 2 36.6	5.2	5.1	0.36	26	0 1.2	12 22 5.50	− 0 57 48.5	5.1	5.0	0.33
11	23 25.8	8 49 11.03	18 44 48.9	5.2	5.0	0.36	27	0 1.8	12 26 39.06	1 28 16.9	5.1	5.0	0.33
12	23 26.9	8 54 13.64	18 26 29.2	5.2	5.0	0.35	28	0 2.5	12 31 12.74	1 58 44.9	5.1	5.0	0.33
13	23 28.0	8 59 15.23	18 7 38.1	5.2	5.0	0.35	29	0 3.1	12 35 46.61	2 29 11.7	5.2	5.0	0.33
14	23 29.0	9 4 15.78	17 48 16.2	5.2	5.0	0.35	30	0 3.7	12 40 20.70	2 59 36.4	5.2	5.0	0.33
15	23 30.1	9 9 15.30	+17 28 24.1	5.2	5.0	0.35	31	0 4.3	12 44 55.05	− 3 29 58.4	5.2	5.0	0.33
16	23 31.1	9 14 13.77	+17 8 2.4	5.2	5.0	0.35	32	0 5.0	12 49 29.71	− 4 0 16.9	5 2	5.0	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 4.3	12 44 55.05	− 3 29 58.4	5.2	5.0	0.33	Nov. 16	0 47.8	16 29 53.71	−22 12 59.8	5.4	5.2	0.38
2	0 5.0	12 49 29.71	4 0 16.9	5.2	5.0	0.33	17	0 49.2	16 35 13.24	22 26 33.7	5.4	5.2	0.38
3	0 5.6	12 54 4.72	4 30 31.1	5.2	5.0	0.33	18	0 50.6	16 40 33.79	22 39 28.4	5.4	5.2	0.38
4	0 6.2	12 58 40.11	5 0 40.3	5.2	5.0	0.33	19	0 52.0	16 45 55.30	22 51 43.1	5.4	5.3	0.38
5	0 6.9	13 3 15.93	5 30 43.8	5.2	5.0	0.33	20	0 53.4	16 51 17.75	23 3 17.4	5.4	5.3	0.38
6	0 7.5	13 7 52.21	− 6 0 40.7	5.2	5.0	0.33	21	0 54.9	16 56 41.09	−23 14 10.6	5.5	5.3	0.38
7	0 8.2	13 12 28.99	6 30 30.2	5.2	5.0	0.33	22	0 56.3	17 2 5.29	23 24 22.3	5.5	5.3	0.38
8	0 8.9	13 17 6.31	7 0 11.6	5.2	5.0	0.33	23	0 57.8	17 7 30.29	23 33 52.1	5.5	5.3	0.39
9	0 9.6	13 21 44.21	7 29 44.1	5.2	5.0	0.34	24	0 59.3	17 12 56.05	23 42 39.4	5.5	5.3	0.39
10	0 10.3	13 26 22.73	7 59 6.9	5.2	5.0	0.34	25	1 0.8	17 18 22.50	23 50 44.0	5.5	5.3	0.39
11	0 11.0	13 31 1.90	− 8 28 19.2	5.2	5.0	0.34	26	1 2.3	17 23 49.59	−23 58 5.3	5.5	5.3	0.39
12	0 11.7	13 35 41.77	8 57 20.2	5.2	5.0	0.34	27	1 3.8	17 29 17.28	24 4 43.0	5.5	5.3	0.39
13	0 12.5	13 40 22.40	9 26 9.2	5.2	5.0	0.34	28	1 5.3	17 34 45.49	24 10 36.8	5.5	5.3	0.39
14	0 13.3	13 45 3.80	9 54 45.4	5.2	5.0	0.34	29	1 6.8	17 40 14.16	24 15 46.3	5.5	5.3	0.39
15	0 14.1	13 49 46.00	10 23 7.9	5.2	5.0	0.34	30	1 8.3	17 45 43.23	24 20 11.2	5.5	5.4	0.39
16	0 14.8	13 54 29.05	−10 51 16.2	5.2	5.0	0.34	Dec. 1	1 9.9	17 51 12.63	−24 23 51.3	5.6	5.4	0.39
17	0 15.6	13 59 12.98	11 19 9.4	5.2	5.0	0.34	2	1 11.4	17 56 42.28	24 26 46.5	5.6	5.4	0.39
18	0 16.4	14 3 57.83	11 46 46.7	5.2	5.0	0.34	3	1 13.0	18 2 12.14	24 28 56.6	5.6	5.4	0.40
19	0 17.2	14 8 43.63	12 14 7.3	5.2	5.0	0.34	4	1 14.5	18 7 42.12	24 30 21.4	5.6	5.4	0.40
20	0 18.0	14 13 30.43	12 41 10.5	5.2	5.0	0.34	5	1 16.1	18 13 12.15	24 31 0.7	5.6	5.4	0.40
21	0 18.8	14 18 18.24	−13 7 55.3	5.2	5.0	0.35	6	1 17.6	18 18 42.18	−24 30 54.7	5.6	5.4	0.40
22	0 19.7	14 23 7.09	13 34 21.2	5.2	5.1	0.35	7	1 19.2	18 24 12.11	24 30 3.4	5.6	5.4	0.40
23	0 20.6	14 27 57.01	14 0 27.2	5.2	5.1	0.35	8	1 20.7	18 29 41.89	24 28 26.5	5.6	5.5	0.40
24	0 21.5	14 32 48.05	14 26 12.6	5.3	5.1	0.35	9	1 22.3	18 35 11.42	24 26 4.2	5.7	5.5	0.40
25	0 22.4	14 37 40.21	14 51 36.5	5.3	5.1	0.35	10	1 23.8	18 40 40.65	24 22 56.8	5.7	5.5	0.40
26	0 23.4	14 42 33.52	−15 16 38.2	5.3	5.1	0.35	11	1 25.4	18 46 9.52	−24 19 4.5	5.7	5.5	0.40
27	0 24.3	14 47 28.00	15 41 16.8	5.3	5.1	0.35	12	1 26.9	18 51 37.96	24 14 27.2	5.7	5.5	0.40
28	0 25.3	14 52 23.67	16 5 31.4	5.3	5.1	0.35	13	1 28.5	18 57 5.92	24 9 5.1	5.7	5.5	0.40
29	0 26.3	14 57 20.55	16 29 21.5	5.3	5.1	0.35	14	1 30.0	19 2 33.31	24 2 58.6	5.7	5.5	0.40
30	0 27.3	15 2 18.64	16 52 46.1	5.3	5.1	0.36	15	1 31.5	19 8 0.08	23 56 7.8	5.7	5.5	0.40
31	0 28.4	15 7 17.96	−17 15 44.4	5.3	5.1	0.36	16	1 33.0	19 13 26.19	−23 48 33.2	5.8	5.6	0.41
Nov. 1	0 29.4	15 12 18.52	17 38 15.6	5.3	5.1	0.36	17	1 34.4	19 18 51.57	23 40 15.0	5.8	5.6	0.41
2	0 30.5	15 17 20.32	18 0 18.9	5.3	5.1	0.36	18	1 35.9	19 24 16.16	23 31 13.5	5.8	5.6	0.41
3	0 31.6	15 22 23.37	18 21 53.3	5.3	5.1	0.36	19	1 37.3	19 29 39.91	23 21 29.2	5.8	5.6	0.41
4	0 32.7	15 27 27.67	18 42 59.2	5.3	5.1	0.36	20	1 38.8	19 35 2.79	23 11 2.4	5.8	5.6	0.41
5	0 33.9	15 32 33.22	−19 3 32.9	5.3	5.1	0.36	21	1 40.2	19 40 24.72	−22 59 53.6	5.8	5.6	0.41
6	0 35.1	15 37 40.01	19 23 36.5	5.3	5.2	0.36	22	1 41.6	19 45 45.66	22 48 3.4	5.8	5.6	0.41
7	0 36.3	15 42 48.04	19 43 8.2	5.3	5.2	0.36	23	1 43.0	19 51 5.57	22 35 32.3	5.9	5.7	0.41
8	0 37.5	15 47 57.29	20 2 7.3	5.3	5.2	0.37	24	1 44.4	19 56 24.40	22 22 20.7	5.9	5.7	0.41
9	0 38.7	15 53 7.75	20 20 33.1	5.3	5.2	0.37	25	1 45.7	20 1 42.14	22 8 29.1	5.9	5.7	0.41
10	0 39.9	15 58 19.43	−20 38 24.9	5.4	5.2	0.37	26	1 47.1	20 6 58.74	−21 53 58.1	5.9	5.7	0.41
11	0 41.2	16 3 32.29	20 55 41.8	5.4	5.2	0.37	27	1 48.4	20 12 14.15	21 38 48.3	5.9	5.7	0.41
12	0 42.5	16 8 46.33	21 12 23.1	5.4	5.2	0.37	28	1 49.7	20 17 28.34	21 23 0.3	5.9	5.7	0.41
13	0 43.8	16 14 1.52	21 28 28.2	5.4	5.2	0.37	29	1 51.0	20 22 41.28	21 6 34.8	6.0	5.8	0.41
14	0 45.1	16 19 17.82	21 43 56.5	5.4	5.2	0.38	30	1 52.2	20 27 52.96	20 49 32.4	6.0	5.8	0.41
15	0 46.5	16 24 35.23	−21 58 47.2	5.4	5.2	0.38	31	1 53.4	20 33 3.35	−20 31 53.6	6.0	5.8	0.41
16	0 47.8	16 29 53.71	−22 12 59.8	5.4	5.2	0.38	32	1 54.6	20 38 12.41	−20 13 39.9	6.0	5.8	0.41

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi diam.	S.T. of Sem. Pass Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 1	18 27.8	23 10 26.72	−6 29 22.5	1.8	18.9	1.35	July 17	15 33.8	23 17 18.69	−6 0 40.3	2.0	21.8	1.56
2	18 24.3	23 10 50.40	6 27 11.1	1.8	18.9	1.35	18	15 29.8	23 17 11.21	6 1 46.8	2.1	21.9	1.56
3	18 20.7	23 11 13.48	6 25 3.5	1.8	19.0	1.36	19	15 25.7	23 17 3.03	6 2 57.7	2.1	22.0	1.57
4	18 17.2	23 11 35.98	6 22 59.6	1.8	19.0	1.36	20	15 21.6	23 16 54.14	6 4 12.8	2.1	22.0	1.57
5	18 13.6	23 11 57.87	6 20 59.5	1.8	19.1	1.36	21	15 17.5	23 16 44.57	6 5 32.2	2.1	22.1	1.58
6	18 10.0	23 12 19.16	−6 19 3.4	1.8	19.1	1.37	22	15 13.4	23 16 34.30	−6 6 55.9	2.1	22.1	1.58
7	18 6.4	23 12 39.84	6 17 11.1	1.8	19.2	1.37	23	15 9.3	23 16 23.35	6 8 23.8	2.1	22.2	1.58
8	18 2.8	23 12 59.90	6 15 22.7	1.8	19.3	1.38	24	15 5.2	23 16 11.71	6 9 55.8	2.1	22.2	1.59
9	17 59.2	23 13 19.34	6 13 38.4	1.8	19.3	1.38	25	15 1.0	23 15 59.39	6 11 32.0	2.1	22.3	1.59
10	17 55.6	23 13 38.16	6 11 58.0	1.8	19.4	1.39	26	14 56.9	23 15 46.40	6 13 12.2	2.1	22.4	1.60
11	17 52.0	23 13 56.34	−6 10 21.7	1.8	19.5	1.39	27	14 52.8	23 15 32.76	−6 14 56.4	2.1	22.4	1.60
12	17 48.4	23 14 13.89	6 8 49.4	1.8	19.5	1.40	28	14 48.6	23 15 18.44	6 16 44.6	2.1	22.5	1.61
13	17 44.7	23 14 30.81	6 7 21.3	1.8	19.6	1.40	29	14 44.4	23 15 3.47	6 18 36.7	2.1	22.5	1.61
14	17 41.0	23 14 47.07	6 5 57.2	1.8	19.7	1.41	30	14 40.2	23 14 47.85	6 20 32.7	2.1	22.6	1.61
15	17 37.4	23 15 2.69	6 4 37.3	1.8	19.8	1.41	31	14 36.0	23 14 31.60	6 22 32.5	2.1	22.6	1.62
16	17 33.7	23 15 17.67	−6 3 21.6	1.9	19.8	1.41	Aug. 1	14 31.8	23 14 14.70	−6 24 36.0	2.1	22.7	1.62
17	17 30.0	23 15 31.98	6 2 10.1	1.9	19.9	1.42	2	14 27.6	23 13 57.19	6 26 43.1	2.1	22.7	1.63
18	17 26.3	23 15 45.64	6 1 2.8	1.9	19.9	1.42	3	14 23.3	23 13 39.08	6 28 53.8	2.1	22.8	1.63
19	17 22.6	23 15 58.63	5 59 59.8	1.9	20.0	1.43	4	14 19.1	23 13 20.36	6 31 8.0	2.1	22.8	1.63
20	17 18.8	23 16 10.96	5 59 1.0	1.9	20.1	1.43	5	14 14.9	23 13 1.06	6 33 25.6	2.1	22.9	1.64
21	17 15.1	23 16 22.61	−5 58 6.6	1.9	20.1	1.44	6	14 10.6	23 12 41.18	−6 35 46.5	2.2	22.9	1.64
22	17 11.4	23 16 33.59	5 57 16.4	1.9	20.2	1.44	7	14 6.3	23 12 20.74	6 38 10.7	2.2	23.0	1.64
23	17 7.6	23 16 43.88	5 56 30.6	1.9	20.3	1.45	8	14 2.0	23 11 59.76	6 40 38.0	2.2	23.0	1.65
24	17 3.8	23 16 53.50	5 55 49.2	1.9	20.3	1.45	9	13 57.7	23 11 38.24	6 43 8.3	2.2	23.1	1.65
25	17 0.0	23 17 2.42	5 55 12.2	1.9	20.4	1.46	10	13 53.4	23 11 16.20	6 45 41.5	2.2	23.1	1.65
26	16 56.2	23 17 10.65	−5 54 39.6	1.9	20.4	1.46	11	13 49.1	23 10 53.65	−6 48 17.5	2.2	23.1	1.65
27	16 52.4	23 17 18.18	5 54 11.5	1.9	20.5	1.47	12	13 44.8	23 10 30.62	6 50 56.2	2.2	23.2	1.66
28	16 48.6	23 17 25.02	5 53 47.8	1.9	20.6	1.47	13	13 40.5	23 10 7.12	6 53 37.4	2.2	23.2	1.66
29	16 44.8	23 17 31.14	5 53 28.6	1.9	20.6	1.48	14	13 36.2	23 9 43.15	6 56 21.1	2.2	23.3	1.66
30	16 41.0	23 17 36.56	5 53 13.9	1.9	20.7	1.48	15	13 31.8	23 9 18.74	6 59 7.2	2.2	23.3	1.67
July 1	16 37.1	23 17 41.26	−5 53 3.8	1.9	20.8	1.49	16	13 27.5	23 8 53.91	−7 1 55.5	2.2	23.3	1.67
2	16 33.2	23 17 45.25	5 52 58.2	2.0	20.9	1.49	17	13 23.1	23 8 28.67	7 4 45.9	2.2	23.4	1.67
3	16 29.4	23 17 48.52	5 52 57.2	2.0	20.9	1.50	18	13 18.8	23 8 3.03	7 7 38.3	2.2	23.4	1.68
4	16 25.5	23 17 51.07	5 53 0.8	2.0	21.0	1.50	19	13 14.4	23 7 37.01	7 10 32.7	2.2	23.4	1.68
5	16 21.6	23 17 52.90	5 53 8.9	2.0	21.0	1.50	20	13 10.1	23 7 10.64	7 13 28.8	2.2	23.5	1.68
6	16 17.7	23 17 54.01	−5 53 21.6	2.0	21.1	1.51	21	13 5.7	23 6 43.91	−7 16 26.5	2.2	23.5	1.68
7	16 13.7	23 17 54.40	5 53 38.8	2.0	21.2	1.51	22	13 1.3	23 6 16.86	7 19 25.8	2.2	23.5	1.68
8	16 9.8	23 17 54.06	5 54 0.7	2.0	21.2	1.52	23	12 56.9	23 5 49.51	7 22 26.5	2.2	23.5	1.68
9	16 5.8	23 17 53.00	5 54 27.1	2.0	21.3	1.52	24	12 52.5	23 5 21.87	7 25 28.5	2.2	23.6	1.69
10	16 1.9	23 17 51.21	5 54 58.1	2.0	21.4	1.53	25	12 48.1	23 4 53.95	7 28 31.7	2.2	23.6	1.69
11	15 57.9	23 17 48.71	−5 55 33.5	2.0	21.4	1.53	26	12 43.7	23 4 25.78	−7 31 35.8	2.2	23.6	1.69
12	15 53.9	23 17 45.49	5 56 13.5	2.0	21.5	1.54	27	12 39.3	23 3 57.38	7 34 40.8	2.2	23.6	1.69
13	15 49.9	23 17 41.56	5 56 58.0	2.0	21.6	1.54	28	12 34.9	23 3 28.77	7 37 46.7	2.2	23.6	1.69
14	15 45.9	23 17 36.91	5 57 46.9	2.0	21.6	1.55	29	12 30.5	23 2 59.96	7 40 53.2	2.2	23.7	1.69
15	15 41.9	23 17 31.55	5 58 40.3	2.0	21.7	1.55	30	12 26.1	23 2 30.99	7 11 0.2	2.2	23.7	1.69
16	15 37.8	23 17 25.47	−5 59 38.1	2.0	21.8	1.56	31	12 21.7	23 2 1.88	−7 47 7.5	2.2	23.7	1.70
17	15 33.8	23 17 18.69	−6 0 40.3	2.0	21.8	1.56	Sept. 1	12 17.2	23 1 32.65	−7 50 15.0	2.2	23.7	1.70

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Sept. 1	12 17.2	23 1 32.65	−7 50 15.0	2.2	23.7	1.70
2	12 12.8	23 1 3.30	7 53 22.5	2.2	23.7	1.70
3	12 8.4	23 0 33.89	7 56 30.0	2.2	23.7	1.70
4	12 4.0	23 0 4.44	7 59 37.2	2.2	23.7	1.70
5	11 59.5	22 59 34.94	8 2 44.0	2.2	23.7	1.70
6	11 55.1	22 59 5.43	−8 5 50.2	2.2	23.7	1.70
7	11 50.7	22 58 35.94	8 8 55.7	2.2	23.7	1.70
8	11 46.2	22 58 6.49	8 12 0.5	2.2	23.7	1.70
9	11 41.8	22 57 37.09	8 15 4.2	2.2	23.7	1.70
10	11 37.4	22 57 7.78	8 18 6.8	2.2	23.7	1.70
11	11 33.0	22 56 38.58	−8 21 8.2	2.2	23.6	1.70
12	11 28.6	22 56 9.50	8 24 8.2	2.2	23.6	1.70
13	11 24.2	22 55 40.58	8 27 6.7	2.2	23.6	1.70
14	11 19.8	22 55 11.83	8 30 3.5	2.2	23.6	1.70
15	11 15.4	22 54 43.27	8 32 58.6	2.2	23.6	1.70
16	11 11.0	22 54 14.91	−8 35 51.8	2.2	23.5	1.70
17	11 6.6	22 53 46.79	8 38 43.0	2.2	23.5	1.69
18	11 2.2	22 53 18.92	8 41 32.1	2.2	23.5	1.69
19	10 57.8	22 52 51.32	8 44 18.9	2.2	23.5	1.69
20	10 53.4	22 52 24.01	8 47 3.4	2.2	23.5	1.69
21	10 49.0	22 51 57.01	−8 49 45.5	2.2	23.4	1.69
22	10 44.6	22 51 30.35	8 52 25.0	2.2	23.4	1.69
23	10 40.3	22 51 4.02	8 55 1.9	2.2	23.4	1.69
24	10 35.9	22 50 38.07	8 57 36.0	2.2	23.4	1.69
25	10 31.6	22 50 12.51	9 0 7.1	2.2	23.3	1.68
26	10 27.2	22 49 47.35	−9 2 35.3	2.2	23.3	1.68
27	10 22.9	22 49 22.62	9 5 0.5	2.2	23.3	1.68
28	10 18.5	22 48 58.32	9 7 22.5	2.2	23.2	1.67
29	10 14.2	22 48 34.50	9 9 41.1	2.2	23.2	1.67
30	10 9.9	22 48 11.16	9 11 56.3	2.2	23.2	1.67
Oct. 1	10 5.6	22 47 48.32	−9 14 8.1	2.2	23.1	1.66
2	10 1.3	22 47 25.99	9 16 16.2	2.2	23.1	1.66
3	9 57.0	22 47 4.20	9 18 20.7	2.2	23.0	1.66
4	9 52.7	22 46 42.96	9 20 21.5	2.1	23.0	1.65
5	9 48.4	22 46 22.28	9 22 18.5	2.1	22.9	1.65
6	9 44.1	22 46 2.18	−9 24 11.6	2.1	22.9	1.65
7	9 39.9	22 45 42.67	9 26 0.8	2.1	22.8	1.64
8	9 35.6	22 45 23.77	9 27 45.8	2.1	22.8	1.64
9	9 31.4	22 45 5.49	9 29 26.8	2.1	22.7	1.64
10	9 27.2	22 44 47.84	9 31 3.6	2.1	22.7	1.63
11	9 23.0	22 44 30.84	−9 32 36.3	2.1	22.6	1.63
12	9 18.8	22 44 14.48	9 34 4.7	2.1	22.6	1.63
13	9 14.6	22 43 58.78	9 35 28.7	2.1	22.5	1.62
14	9 10.4	22 43 43.75	9 36 48.5	2.1	22.5	1.62
15	9 6.2	22 43 29.40	9 38 3.9	2.1	22.4	1.62
16	9 2.1	22 43 15.74	−9 39 15.0	2.1	22.4	1.61
17	8 57.9	22 43 2.77	−9 40 21.6	2.1	22.3	1.61
Oct. 17	8 57.9	22 43 2.77	− 9 40 21.6	2.1	22.3	1.61
18	8 53.8	22 42 50.50	9 41 23.8	2.1	22.2	1.61
19	8 49.7	22 42 38.94	9 42 21.4	2.1	22.2	1.60
20	8 45.6	22 42 28.09	9 43 14.6	2.1	22.1	1.60
21	8 41.5	22 42 17.97	9 44 3.2	2.1	22.1	1.59
22	8 37.4	22 42 8.57	−9 44 47.3	2.1	22.0	1.59
23	8 33.3	22 41 59.90	9 45 26.9	2.1	21.9	1.58
24	8 29.2	22 41 51.97	9 46 1.8	2.1	21.9	1.58
25	8 25.2	22 41 44.79	9 46 32.1	2.1	21.8	1.57
26	8 21.2	22 41 38.36	9 46 57.8	2.1	21.7	1.57
27	8 17.1	22 41 32.68	−9 47 18.8	2.0	21.7	1.56
28	8 13.1	22 41 27.76	9 47 35.1	2.0	21.6	1.56
29	8 9.1	22 41 23.61	9 47 46.8	2.0	21.5	1.55
30	8 5.1	22 41 20.22	9 47 53.8	2.0	21.5	1.55
31	8 1.1	22 41 17.59	9 47 56.2	2.0	21.4	1.54
Nov. 1	7 57.2	22 41 15.74	−9 47 53.8	2.0	21.4	1.54
2	7 53.2	22 41 14.66	9 47 46.7	2.0	21.3	1.53
3	7 49.3	22 41 14.34	9 47 34.9	2.0	21.2	1.53
4	7 45.4	22 41 14.80	9 47 18.4	2.0	21.2	1.52
5	7 41.5	22 41 16.03	9 46 57.2	2.0	21.1	1.52
6	7 37.6	22 41 18.03	−9 46 31.4	2.0	21.0	1.51
7	7 33.7	22 41 20.80	9 46 0.9	2.0	21.0	1.51
8	7 29.8	22 41 24.34	9 45 25.8	2.0	20.9	1.50
9	7 25.9	22 41 28.65	9 44 46.1	2.0	20.8	1.50
10	7 22.1	22 41 33.72	9 44 1.8	2.0	20.8	1.50
11	7 18.3	22 41 39.55	−9 43 12.8	2.0	20.7	1.49
12	7 14.4	22 41 46.14	9 42 19.3	1.9	20.6	1.49
13	7 10.6	22 41 53.47	9 41 21.3	1.9	20.6	1.48
14	7 6.8	22 42 1.55	9 40 18.8	1.9	20.5	1.48
15	7 3.0	22 42 10.37	9 39 11.8	1.9	20.4	1.47
16	6 59.3	22 42 19.94	−9 38 0.3	1.9	20.4	1.47
17	6 55.5	22 42 30.24	9 36 44.4	1.9	20.3	1.46
18	6 51.8	22 42 41.28	9 35 24.1	1.9	20.2	1.46
19	6 48.0	22 42 53.05	9 33 59.5	1.9	20.1	1.45
20	6 44.3	22 43 5.54	9 32 30.5	1.9	20.1	1.45
21	6 40.6	22 43 18.75	−9 30 57.2	1.9	20.0	1.44
22	6 36.9	22 43 32.68	9 29 19.6	1.9	20.0	1.44
23	6 33.2	22 43 47.32	9 27 37.7	1.9	19.9	1.43
24	6 29.5	22 44 2.67	9 25 51.6	1.9	19.8	1.43
25	6 25.8	22 44 18.72	9 24 1.2	1.9	19.8	1.42
26	6 22.2	22 44 35.47	−9 22 6.6	1.9	19.7	1.41
27	6 18.6	22 44 52.92	9 20 7.8	1.9	19.6	1.41
28	6 14.9	22 45 11.05	9 18 4.9	1.8	19.5	1.40
29	6 11.3	22 45 29.86	9 15 57.8	1.8	19.5	1.40
30	6 7.7	22 45 49.36	9 13 46.6	1.8	19.4	1.40
Dec. 1	6 4.1	22 46 9.52	−9 11 31.4	1.8	19.4	1.39
2	6 0.5	22 46 30.34	−9 9 12.2	1.8	19.3	1.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	16 32.9	11 15 52.54	+6 53 8.2	1.0	8.8	0.63	Feb. 15	13 24.5	11 8 21.70	+7 51 27.0	1.1	9.3	0.67
1	16 28.9	11 15 50.84	6 53 36.5	1.0	8.8	0.63	16	13 20.3	11 8 5.38	7 53 18.5	1.1	9.3	0.67
2	16 24.9	11 15 48.72	6 54 7.2	1.0	8.8	0.63	17	13 16.1	11 7 48.90	7 55 10.6	1.1	9.3	0.67
3	16 21.0	11 15 46.20	6 54 40.4	1.0	8.8	0.63	18	13 11.9	11 7 32.27	7 57 3.3	1.1	9.3	0.67
4	16 17.0	11 15 43.27	6 55 16.2	1.0	8.9	0.63	19	13 7.7	11 7 15.50	7 58 56.5	1.1	9.3	0.67
5	16 13.0	11 15 39.93	+6 55 54.4	1.0	8.9	0.64	20	13 3.5	11 6 58.60	+8 0 50.1	1.1	9.3	0.67
6	16 9.0	11 15 36.18	6 56 35.2	1.0	8.9	0.64	21	12 59.3	11 6 41.59	8 2 44.2	1.1	9.3	0.67
7	16 5.0	11 15 32.05	6 57 18.4	1.0	8.9	0.64	22	12 55.0	11 6 24.47	8 4 38.6	1.1	9.3	0.67
8	16 1.0	11 15 27.51	6 58 4.0	1.0	8.9	0.64	23	12 50.8	11 6 7.24	8 6 33.3	1.1	9.3	0.67
9	15 57.0	11 15 22.58	6 58 52.0	1.0	8.9	0.64	24	12 46.6	11 5 49.92	8 8 28.3	1.1	9.3	0.67
10	15 52.9	11 15 17.26	+6 59 42.4	1.0	8.9	0.64	25	12 42.4	11 5 32.50	+8 10 23.4	1.1	9.3	0.67
11	15 48.9	11 15 11.55	7 0 35.1	1.0	8.9	0.64	26	12 38.2	11 5 15.02	8 12 18.6	1.1	9.3	0.67
12	15 44.9	11 15 5.45	7 1 30.2	1.0	8.9	[illegible]	27	12 33.9	11 4 57.47	8 14 13.8	1.1	9.3	0.67
13	15 40.8	11 14 58.97	7 2 27.6	1.0	9.0	0.65	28	12 29.7	11 4 39.87	8 16 9.0	1.1	9.3	0.67
14	15 36.8	11 14 52.09	7 3 27.3	1.0	9.0	0.65	Mar. 1	12 25.5	11 4 22.22	8 18 4.2	1.1	9.3	0.67
15	15 32.7	11 14 44.85	+7 4 29.2	1.0	9.0	0.65	2	12 21.3	11 4 4.53	+8 19 59.2	1.1	9.3	0.67
16	15 28.7	11 14 37.24	7 5 33.3	1.0	9.0	0.65	3	12 17.0	11 3 46.81	8 21 54.0	1.1	9.3	0.67
17	15 24.6	11 14 29.26	7 6 39.6	1.0	9.0	0.65	4	12 12.8	11 3 29.08	8 23 48.6	1.1	9.3	0.67
18	15 20.6	11 14 20.92	7 7 48.0	1.0	9.0	0.65	5	12 8.6	11 3 11.34	8 25 42.8	1.1	9.3	0.67
19	15 16.5	11 14 12.22	7 8 58.6	1.0	9.0	0.65	6	12 4.3	11 2 53.60	8 27 36.6	1.1	9.3	0.67
20	15 12.4	11 14 3.16	+7 10 11.3	1.0	9.0	0.65	7	12 0.1	11 2 35.88	+8 29 30.0	1.1	9.3	0.67
21	15 8.3	11 13 53.76	7 11 25.9	1.0	9.0	0.66	8	11 55.9	11 2 18.19	8 31 22.9	1.1	9.3	0.67
22	15 4.2	11 13 44.01	7 12 42.5	1.0	9.1	0.66	9	11 51.7	11 2 0.52	8 33 15.2	1.1	9.3	0.67
23	15 0.1	11 13 33.92	7 14 1.1	1.0	9.1	0.66	10	11 47.4	11 1 42.91	8 35 6.8	1.1	9.3	0.67
24	14 56.0	11 13 23.50	7 15 21.6	1.0	9.1	0.66	11	11 43.2	11 1 25.34	8 36 57.7	1.1	9.3	0.67
25	14 51.9	11 13 12.75	+7 16 44.0	1.0	9.1	0.66	12	11 39.0	11 1 7.84	+8 38 47.9	1.1	9.3	0.67
26	14 47.8	11 13 1.67	7 18 8.2	1.0	9.1	0.66	13	11 34.8	11 0 50.42	8 40 37.2	1.1	9.3	0.67
27	14 43.7	11 12 50.27	7 19 34.2	1.0	9.1	0.66	14	11 30.6	11 0 33.08	8 42 25.6	1.1	9.3	0.67
28	14 39.6	11 12 38.56	7 21 2.0	1.0	9.1	0.66	15	11 26.3	11 0 15.84	8 44 13.1	1.1	9.3	0.67
29	14 35.4	11 12 26.54	7 22 31.5	1.0	9.1	0.66	16	11 22.1	10 59 58.71	8 45 59.6	1.1	9.3	0.67
30	14 31.3	11 12 14.22	+7 24 2.6	1.0	9.2	0.66	17	11 17.9	10 59 41.69	+8 47 45.0	1.1	9.3	0.67
31	14 27.1	11 12 1.60	7 25 35.4	1.0	9.2	0.66	18	11 13.7	10 59 24.79	8 49 29.3	1.1	9.3	0.67
Feb. 1	14 23.0	11 11 48.70	7 27 9.8	1.0	9.2	0.66	19	11 9.5	10 59 8.03	8 51 12.4	1.1	9.3	0.67
2	14 18.8	11 11 35.50	7 28 45.7	1.0	9.2	0.66	20	11 5.3	10 58 51.41	8 52 54.3	1.1	9.3	0.67
3	14 14.7	11 11 22.04	7 30 23.1	1.0	9.2	0.66	21	11 1.1	10 58 34.93	8 54 35.0	1.1	9.3	0.67
4	14 10.5	11 11 8.30	+7 32 1.9	1.0	9.2	0.66	22	10 56.9	10 58 18.62	+8 56 14.3	1.1	9.3	0.67
5	14 6.4	11 10 54.29	7 33 42.0	1.0	9.2	0.66	23	10 52.7	10 58 2.47	8 57 52.2	1.1	9.3	0.67
6	14 2.2	11 10 40.03	7 35 23.5	1.0	9.2	0.67	24	10 48.5	10 57 46.49	8 59 28.8	1.1	9.3	0.67
7	13 58.0	11 10 25.53	7 37 6.3	1.0	9.2	0.67	25	10 44.3	10 57 30.70	9 1 3.9	1.1	9.3	0.67
8	13 53.9	11 10 10.80	7 38 50.3	1.0	9.3	0.67	26	10 40.1	10 57 15.10	9 2 37.5	1.0	9.3	0.67
9	13 49.7	11 9 55.83	+7 40 35.4	1.0	9.3	0.67	27	10 35.9	10 56 59.69	+9 4 9.4	1.0	9.2	0.67
10	13 45.5	11 9 40.64	7 42 21.6	1.0	9.3	0.67	28	10 31.7	10 56 44.48	9 5 39.9	1.0	9.2	0.67
11	13 41.3	11 9 25.24	7 44 8.9	1.0	9.3	0.67	29	10 27.5	10 56 29.49	9 7 8.8	1.0	9.2	0.67
12	13 37.1	11 9 9.61	7 45 57.1	1.0	9.3	0.67	30	10 23.4	10 56 14.72	9 8 36.0	1.0	9.2	0.67
13	13 32.9	11 8 53.84	7 47 46.2	1.0	9.3	0.67	31	10 19.2	10 56 0.18	9 10 1.5	1.0	9.2	0.67
14	13 28.7	11 8 37.86	+7 49 36.2	1.1	9.3	0.67	Apr. 1	10 15.0	10 55 45.87	+9 11 25.2	1.0	9.2	0.66
15	13 24.5	11 8 21.70	+7 51 27.0	1.1	9.3	0.67	2	10 10.8	10 55 31.81	+9 12 47.2	1.0	9.2	0.66

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Polar Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	10 15.0	10 55 45.87	+9 11 25.2	1.0	9.2	0.66	May 17	7 9.0	10 50 36.58	+9 36 36.1	1.0	8.6	0.62
2	10 10.8	10 55 31.81	9 12 47.2	1.0	9.2	0.66	18	7 5.1	10 50 38.60	9 36 13.3	1.0	8.6	0.62
3	10 6.7	10 55 17.99	9 14 7.4	1.0	9.2	0.66	19	7 1.2	10 50 41.00	9 35 48.2	1.0	8.6	0.62
4	10 2.5	10 55 4.44	9 15 25.6	1.0	9.2	0.66	20	6 57.3	10 50 43.78	9 35 20.7	1.0	8.6	0.62
5	9 58.4	10 54 51.15	9 16 42.0	1.0	9.2	0.66	21	6 53.4	10 50 46.94	9 34 50.9	1.0	8.5	0.61
6	9 54.2	10 54 38.14	+9 17 56.5	1.0	9.2	0.66	22	6 49.6	10 50 50.49	+9 34 18.8	1.0	8.5	0.61
7	9 50.1	10 54 25.41	9 19 8.9	1.0	9.2	0.66	23	6 45.7	10 50 54.42	9 33 44.3	1.0	8.5	0.61
8	9 45.9	10 54 12.97	9 20 19.4	1.0	9.1	0.66	24	6 41.9	10 50 58.73	9 33 7.5	1.0	8.5	0.61
9	9 41.8	10 54 0.83	9 21 27.8	1.0	9.1	0.66	25	6 38.0	10 51 3.42	9 32 28.5	1.0	8.5	0.61
10	9 37.7	10 53 48.98	9 22 34.3	1.0	9.1	0.66	26	6 34.2	10 51 8.49	9 31 47.1	1.0	8.5	0.61
11	9 33.5	10 53 37.44	+9 23 38.4	1.0	9.1	0.66	27	6 30.3	10 51 13.93	+9 31 3.5	1.0	8.5	0.61
12	9 29.4	10 53 26.20	9 24 40.5	1.0	9.1	0.66	28	6 26.5	10 51 19.75	9 30 17.6	1.0	8.5	0.61
13	9 25.3	10 53 15.28	9 25 40.5	1.0	9.1	0.66	29	6 22.6	10 51 25.95	9 29 29.4	1.0	8.4	0.61
14	9 21.2	10 53 4.68	9 26 38.3	1.0	9.1	0.66	30	6 18.8	10 51 32.52	9 28 39.0	1.0	8.4	0.61
15	9 17.1	10 52 54.41	9 27 33.9	1.0	9.1	0.66	31	6 15.0	10 51 39.46	9 27 46.4	1.0	8.4	0.61
16	9 13.0	10 52 44.47	+9 28 27.2	1.0	9.1	0.66	Dec. 1	19 15.0	11 59 11.42	+2 23 5.6	0.9	8.1	0.58
17	9 8.9	10 52 34.86	9 29 18.3	1.0	9.0	0.66	2	19 11.3	11 59 26.01	2 21 47.1	0.9	8.1	0.58
18	9 4.8	10 52 25.59	9 30 7.2	1.0	9.0	0.65	3	19 7.6	11 59 40.26	2 20 30.9	0.9	8.1	0.58
19	9 0.8	10 52 16.66	9 30 53.9	1.0	9.0	0.65	4	19 3.9	11 59 54.18	2 19 17.0	0.9	8.1	0.58
20	8 56.7	10 52 8.08	9 31 38.1	1.0	9.0	0.65	5	19 0.2	12 0 7.77	2 18 5.4	0.9	8.1	0.58
21	8 52.6	10 51 59.85	+9 32 20.0	1.0	9.0	0.65	6	18 56.5	12 0 21.02	+2 16 56.1	0.9	8.1	0.58
22	8 48.5	10 51 51.98	9 32 59.7	1.0	9.0	0.65	7	18 52.7	12 0 33.92	2 15 49.2	0.9	8.2	0.58
23	8 44.5	10 51 44.46	9 33 37.1	1.0	9.0	0.65	8	18 49.0	12 0 46.47	2 14 44.6	0.9	8.2	0.58
24	8 40.5	10 51 37.29	9 34 12.1	1.0	9.0	0.65	9	18 45.3	12 0 58.68	2 13 42.4	0.9	8.2	0.58
25	8 36.4	10 51 30.48	9 34 44.8	1.0	8.9	0.65	10	18 41.5	12 1 10.55	2 12 42.5	0.9	8.2	0.58
26	8 32.4	10 51 24.04	+9 35 15.0	1.0	8.9	0.65	11	18 37.8	12 1 22.06	+2 11 45.0	0.9	8.2	0.58
27	8 28.3	10 51 17.97	9 35 43.0	1.0	8.9	0.64	12	18 34.1	12 1 33.21	2 10 50.0	0.9	8.2	0.58
28	8 24.3	10 51 12.26	9 36 8.6	1.0	8.9	0.64	13	18 30.3	12 1 44.01	2 9 57.4	0.9	8.2	0.59
29	8 20.3	10 51 6.93	9 36 31.8	1.0	6.9	0.64	14	18 26.5	12 1 54.44	2 9 7.2	0.9	8.2	0.59
30	8 16.3	10 51 1.97	9 36 52.6	1.0	8.9	0.64	15	18 22.8	12 2 4.52	2 8 19.4	0.9	8.3	0.59
May 1	8 12.3	10 50 57.39	+9 37 11.0	1.0	8.9	0.64	16	18 19.0	12 2 14.23	+2 7 34.2	0.9	8.3	0.59
2	8 8.3	10 50 53.18	9 37 27.0	1.0	8.8	0.64	17	18 15.2	12 2 23.57	2 6 51.4	0.9	8.3	0.59
3	8 4.3	10 50 49.35	9 37 40.6	1.0	8.8	0.64	18	18 11.5	12 2 32.53	2 6 11.0	0.9	8.3	0.59
4	8 0.3	10 50 45.91	9 37 51.8	1.0	8.8	0.64	19	18 7.7	12 2 41.13	2 5 33.2	0.9	8.3	0.59
5	7 56.3	10 50 42.87	9 38 0.6	1.0	8.8	0.63	20	18 3.9	12 2 49.35	2 4 57.9	0.9	8.3	0.59
6	7 52.3	10 50 40.20	+9 38 6.9	1.0	8.8	0.63	21	18 0.1	12 2 57.19	+2 4 25.1	0.9	8.3	0.59
7	7 48.4	10 50 37.92	9 38 10.8	1.0	8.8	0.63	22	17 56.3	12 3 4.65	2 3 55.0	0.9	8.3	0.59
8	7 44.4	10 50 36.02	9 38 12.3	1.0	8.7	0.63	23	17 52.4	12 3 11.73	2 3 27.3	0.9	8.4	0.60
9	7 40.4	10 50 34.52	9 38 11.3	1.0	8.7	0.63	24	17 48.6	12 3 18.41	2 3 2.2	0.9	8.4	0.60
10	7 36.5	10 50 33.44	9 38 7.9	1.0	8.7	0.63	25	17 44.8	12 3 24.71	2 2 39.7	1.0	8.4	0.60
11	7 32.6	10 50 32.69	+9 38 2.0	1.0	8.7	0.63	26	17 41.0	12 3 30.62	+2 2 19.7	1.0	8.4	0.60
12	7 28.6	10 50 32.36	9 37 53.8	1.0	8.7	0.63	27	17 37.1	12 3 36.14	2 2 2.3	1.0	8.4	0.60
13	7 24.7	10 50 32.42	9 37 43.1	1.0	8.7	0.63	28	17 33.3	12 3 41.27	2 1 47.6	1.0	8.4	0.60
14	7 20.8	10 50 32.87	9 37 29.9	1.0	8.6	0.62	29	17 29.4	12 3 46.00	2 1 35.5	1.0	8.4	0.60
15	7 16.8	10 50 33.72	9 37 14.4	1.0	8.6	0.62	30	17 25.6	12 3 50.33	2 1 25.9	1.0	8.4	0.60
16	7 12.9	10 50 34.96	+9 36 56.4	1.0	8.6	0.62	31	17 21.7	12 3 54.26	+2 1 19.0	1.0	8.5	0.60
17	7 9.0	10 50 36.58	+9 36 36.1	1.0	8.6	0.62	32	17 17.8	12 3 57.78	+2 1 14.7	1.0	8.5	0.60

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 15	18 14.7	13 57 8.65	−11 23 54.0	0.5	1.8	0.12	Mar. 1	15 17.3	13 56 41.24	−11 20 21.8	0.5	1.9	0.13
16	18 10.8	13 57 12.65	11 24 14.3	0.5	1.8	0.12	2	15 13.3	13 56 36.06	11 19 52.5	0.5	1.9	0.13
17	18 7.0	13 57 16.43	11 24 33.4	0.5	1.8	0.12	3	15 9.3	13 56 30.71	11 19 22 3	0.5	1.9	0.13
18	18 3.1	13 57 20.01	11 24 51.3	0.5	1.8	0.12	4	15 5.3	13 56 25.19	11 18 51.1	0.5	1.9	0.13
19	17 59.2	13 57 23.38	11 25 8.1	0.5	1.6	0.12	5	15 1.2	13 56 19.50	11 18 19.0	0.5	1.9	0.13
20	17 55.3	13 57 26.54	−11 25 23.8	0.5	1.8	0.12	6	14 57.2	13 56 13.64	−11 17 46.0	0.5	1.9	0.13
21	17 51.5	13 57 29.48	11 25 38.4	0.5	1.8	0.12	7	14 53.2	13 56 7.61	11 17 12.1	0.5	1.9	0.13
22	17 47.6	13 57 32.22	11 25 51.8	0.5	1.8	0.12	8	14 49.1	13 56 1.43	11 16 37.4	0.5	1.9	0.13
23	17 43.7	13 57 34.75	11 26 4.0	0.5	1.8	0.12	9	14 45.1	13 55 55.08	11 16 1.8	0.5	1.9	0.13
24	17 39.8	13 57 37.06	11 26 15.1	0.5	1.8	0.12	10	14 41.0	13 55 48.58	11 15 25.3	0.5	1.9	0.13
25	17 35.9	13 57 39.17	−11 26 25.0	0.5	1.8	0.12	11	14 37.0	13 55 41.93	−11 14 48.1	0.5	1.9	0.13
26	17 32.0	13 57 41.06	11 26 33.8	0.5	1.8	0.12	12	14 33.0	13 55 35.13	11 14 10.1	0.5	1.9	0.13
27	17 28.1	13 57 42.74	11 26 41.4	0.5	1.8	0.12	13	14 28.9	13 55 28.18	11 13 31.2	0.5	1.9	0.13
28	17 24.2	13 57 44.20	11 26 47.9	0.5	1.8	0.12	14	14 24.9	13 55 21.08	11 12 51.6	0.5	1.9	0.13
29	17 20.3	13 57 45.45	11 26 53.2	0.5	1.8	0.12	15	14 20.8	13 55 13.85	11 12 11.3	0.5	1.9	0.13
30	17 16.3	13 57 46.49	−11 26 57.3	0.5	1.8	0.12	16	14 16.8	13 55 6.49	−11 11 30.2	0.5	1.9	0.13
31	17 12.4	13 57 47.32	11 27 0.3	0.5	1.8	0.12	17	14 12.7	13 54 58.99	11 10 48.4	0.5	1.9	0.13
Feb. 1	17 8.5	13 57 47.93	11 27 2.2	0.5	1.8	0.12	18	14 8.6	13 54 51.36	11 10 5.9	0.5	1.9	0.13
2	17 4.6	13 57 48.33	11 27 2.9	0.5	1.8	0.12	19	14 4 6	13 54 43.61	11 9 22.7	0.5	1.9	0.13
3	17 0.7	13 57 48.51	11 27 2.4	0.5	1.8	0.13	20	14 0.5	13 54 35.74	11 8 38.9	0.5	1.9	0.13
4	16 56.7	13 57 48.49	−11 27 0.8	0.5	1.8	0.13	21	13 56.5	13 54 27.74	−11 7 54.5	0.5	1.9	0.13
5	16 52.8	13 57 48.25	11 26 58.0	0.5	1.8	0.13	22	13 52.4	13 54 19.63	11 7 9.4	0.5	1.9	0.13
6	16 48.9	13 57 47.79	11 26 54.1	0.5	1.8	0.13	23	13 48.3	13 54 11.42	11 6 23.8	0.5	1.9	0.13
7	16 44.9	13 57 47.12	11 26 49.0	0.5	1.8	0.13	24	13 44.2	13 54 3.09	11 5 37.6	0.5	1.9	0.13
8	16 41.0	13 57 46.25	11 26 42.8	0.5	1.8	0.13	25	13 40.2	13 53 54.66	11 4 50.8	0.5	1.9	0.13
9	16 37.0	13 57 45.16	−11 26 35.5	0.5	1.8	0.13	26	13 36.1	13 53 46.13	−11 4 3.4	0.5	1.9	0.13
10	16 33.1	13 57 43.86	11 26 27.0	0.5	1.9	0.13	27	13 32.0	13 53 37.51	11 3 15.6	0.5	1.9	0.13
11	16 29.1	13 57 42.35	11 26 17.4	0.5	1.9	0.13	28	13 28.0	13 53 28.79	11 2 27.3	0.5	1.9	0.13
12	16 25.1	13 57 40.64	11 26 6.7	0.5	1.9	0.13	29	13 23.9	13 53 19.98	11 1 38.5	0.5	1.9	0.13
13	16 21.2	13 57 38.72	11 25 54.9	0.5	1.9	0.13	30	13 19.8	13 53 11.08	11 0 49.2	0.5	1.9	0.13
14	16 17.2	13 57 36.60	−11 25 42.0	0.5	1.9	0.13	31	13 15.7	13 53 2.10	−10 59 59.5	0.5	1.9	0.13
15	16 13.2	13 57 34.27	11 25 27.9	0.5	1.9	0.13	Apr. 1	13 11.6	13 52 53.05	10 59 9.3	0.5	1.9	0.13
16	16 9.3	13 57 31.74	11 25 12.8	0.5	1.9	0.13	2	13 7.6	13 52 43.92	10 58 18.8	0.5	1.9	0.13
17	16 5.3	13 57 29.01	11 24 56.6	0.5	1.9	0.13	3	13 3.5	13 52 34.71	10 57 27.9	0.5	1.9	0.13
18	16 1.3	13 57 26.08	11 24 39.4	0.5	1.9	0.13	4	12 59.4	13 52 25.44	10 56 36.6	0.5	1.9	0.13
19	15 57.3	13 57 22.95	−11 24 21.1	0.5	1.9	0.13	5	12 55.3	13 52 16.12	−10 55 45.0	0.5	1.9	0.13
20	15 53.3	13 57 19.63	11 24 1.7	0.5	1.9	0.13	6	12 51.2	13 52 6.73	10 54 53.1	0.5	1.9	0.13
21	15 49.3	13 57 16.11	11 23 41.3	0.5	1.9	0.13	7	12 47.1	13 51 57.28	10 54 0.0	0.5	1.9	0.13
22	15 45.3	13 57 12.41	11 23 19.8	0.5	1.9	0.13	8	12 43.0	13 51 47.79	10 53 8.4	0.5	1.9	0.13
23	15 41.3	13 57 8.51	11 22 57.4	0.5	1.9	0.13	9	12 38.9	13 51 38.26	10 52 15.7	0.5	1.9	0.13
24	15 37.3	13 57 4.43	−11 22 34.0	0.5	1.9	0.13	10	12 34.8	13 51 28.68	−10 51 22.8	0.5	1.9	0.13
25	15 33.3	13 57 0.16	11 22 9.5	0.5	1.9	0.13	11	12 30.8	13 51 19.07	10 50 29.7	0.5	1.9	0.13
26	15 29.3	13 56 55.70	11 21 44.0	0.5	1.9	0.13	12	12 26.7	13 51 9.43	10 49 36.5	0.5	1.9	0.13
27	15 25.3	13 56 51.06	11 21 17.6	0.5	1.9	0.13	13	12 22.6	13 50 59.76	10 48 43.1	0.5	1.9	0.13
28	15 21.3	13 56 46.24	11 20 50.2	0.5	1.9	0.13	14	12 18.5	13 50 50.06	10 47 49.6	0.5	1.9	0.13
Mar. 1	15 17.3	13 56 41.24	−11 20 21.8	0.5	1.9	0.13	15	12 14.4	13 50 40.35	−10 46 56.0	0.5	1.9	0.13
2	15 13.3	13 56 36.06	−11 19 52.5	0.5	1.9	0.13	16	12 10.3	13 50 30.62	−10 46 2.3	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 16	12 10.3	13 50 30.62	-10 46 2.3	0.5	1.9	0.13	June 1	9 2.9	13 43 56.07	-10 10 4.3	0.5	1.9	0.13
17	12 6.2	13 50 20.89	10 45 8.6	0.5	1.9	0.13	2	8 58.8	13 43 49.99	10 9 31.7	0.5	1.9	0.13
18	12 2.1	13 50 11.15	10 44 14.9	0.5	1.9	0.13	3	8 54.8	13 43 44.06	10 9 0.0	0.5	1.9	0.13
19	11 58.0	13 50 1.40	10 43 21.2	0.5	1.9	0.13	4	8 50.8	13 43 38.29	10 8 29.3	0.5	1.9	0.13
20	11 53.9	13 49 51.66	10 42 27.5	0.5	1.9	0.13	5	8 46.8	13 43 32.67	10 7 59.5	0.5	1.9	0.13
21	11 49.8	13 49 41.93	-10 41 33.9	0.5	1.9	0.13	6	8 42.7	13 43 27.22	-10 7 30.6	0.5	1.9	0.13
22	11 45.7	13 49 32.21	10 40 40.3	0.5	1.9	0.13	7	8 38.7	13 43 21 94	10 7 2.6	0.5	1.9	0.13
23	11 41.6	13 49 22.50	10 39 46.8	0.5	1.9	0.13	8	8 34.7	13 43 16.82	10 6 35.6	0.5	1.9	0.13
24	11 37.5	13 49 12.80	10 38 53.4	0.5	1.9	0.13	9	8 30.7	13 43 11.88	10 6 9.5	0.5	1.9	0.13
25	11 33.4	13 49 3.13	10 38 0.2	0.5	1.9	0.13	10	8 26.7	13 43 7.09	10 5 44.4	0.5	1.9	0.13
26	11 29.4	13 48 53.49	-10 37 7.1	0.5	1.9	0.13	11	8 22.7	13 43 2.48	-10 5 20.4	0.5	1.9	0.13
27	11 25.3	13 48 43.87	10 36 14.2	0.5	1.9	0.13	12	8 18.7	13 42 58.05	10 4 57.3	0.5	1.9	0.13
28	11 21.2	13 48 34.29	10 35 21.5	0.5	1.9	0.13	13	8 14.7	13 42 53.79	10 4 35.2	0.5	1.9	0.13
29	11 17.1	13 48 24.75	10 34 29.0	0.5	1.9	0.13	14	8 10.7	13 42 49.71	10 4 14.2	0.5	1.9	0.13
30	11 13.0	13 48 15.25	10 33 36.8	0.5	1.9	0.13	15	8 6.7	13 42 45.80	10 3 54.2	0.5	1.9	0.13
May 1	11 8.9	13 48 5.79	-10 32 44.9	0.5	1.9	0.13	16	8 2.7	13 42 42.08	-10 3 35.2	0.5	1.9	0.13
2	11 4.8	13 47 56.39	10 31 53.2	0.5	1.9	0.13	17	7 58.7	13 42 38.54	10 3 17.3	0.5	1.9	0.13
3	11 0.7	13 47 47.04	10 31 1.8	0.5	1.9	0.13	18	7 54.7	13 42 35.18	10 3 0.4	0.5	1.9	0.13
4	10 56.6	13 47 37.75	10 30 10.8	0.5	1.9	0.13	19	7 50.7	13 42 32.00	10 2 44.6	0.5	1.9	0.13
5	10 52.6	13 47 28.52	10 29 20.1	0.5	1.9	0.13	20	7 46.7	13 42 29.01	10 2 29.8	0.5	1.9	0.13
6	10 48.5	13 47 19.35	-10 28 29.8	0.5	1.9	0.13	21	7 42.7	13 42 26.21	-10 2 16.1	0.5	1.9	0.13
7	10 44.4	13 47 10.26	10 27 40.0	0.5	1.9	0.13	22	7 38.8	13 42 23.59	10 2 3.5	0.5	1.9	0.13
8	10 40.3	13 47 1.23	10 26 50.5	0.5	1.9	0.13	23	7 34.8	13 42 21.16	10 1 51.9	0.5	1.9	0.13
9	10 36.2	13 46 52.29	10 26 1.5	0.5	1.9	0.13	24	7 30.8	13 42 18.92	10 1 41.4	0.5	1.9	0.13
10	10 32.2	13 46 43.43	10 25 13.0	0.5	1.9	0.13	25	7 26.8	13 42 16.86	10 1 31.9	0.5	1.9	0.13
11	10 28.1	13 46 34.66	-10 24 25.0	0.5	1.9	0.13	26	7 22.9	13 42 15.00	-10 1 23.6	0.5	1.9	0.13
12	10 24.0	13 46 25.97	10 23 37.5	0.5	1.9	0.13	27	7 18.9	13 42 13.33	10 1 16.4	0.5	1.9	0.13
13	10 19.9	13 46 17.38	10 22 50.5	0.5	1.9	0.13	28	7 15.0	13 42 11.85	10 1 10.3	0.5	1.9	0.13
14	10 15.9	13 46 8.89	10 22 4.1	0.5	1.9	0.13	29	7 11.0	13 42 10.56	10 1 5.3	0.5	1.9	0.13
15	10 11.8	13 46 0.50	10 21 18.3	0.5	1.9	0.13	30	7 7.1	13 42 9.47	10 1 1.4	0.5	1.8	0.13
16	10 7.7	13 45 52.21	-10 20 33.0	0.5	1.9	0.13	July 1	7 3.1	13 42 8.57	-10 0 58.6	0.5	1.8	0.13
17	10 3.6	13 45 44.02	10 19 48.4	0.5	1.9	0.13	2	6 59.2	13 42 7.87	10 0 56.9	0.5	1.8	0.12
18	9 59.6	13 45 35.95	10 19 4.4	0.5	1.9	0.13	3	6 55.2	13 42 7.37	10 0 56.3	0.5	1.8	0.12
19	9 55.5	13 45 27.99	10 18 21.1	0.5	1.9	0.13	4	6 51.3	13 42 7.07	10 0 56.9	0.5	1.8	0.12
20	9 51.5	13 45 20.14	10 17 38.4	0.5	1.9	0.13	5	6 47.4	13 42 6.97	10 0 58.6	0.5	1.8	0.12
21	9 47.4	13 45 12.42	-10 16 56.4	0.5	1.9	0.13	6	6 43.4	13 42 7.06	-10 1 1.5	0.5	1.8	0.12
22	9 43.3	13 45 4.82	10 16 15.2	0.5	1.9	0.13	7	6 39.5	13 42 7.35	10 1 5.5	0.5	1.8	0.12
23	9 39.3	13 44 57.34	10 15 34.6	0.5	1.9	0.13	8	6 35.6	13 42 7.84	10 1 10.6	0.5	1.8	0.12
24	9 35.2	13 44 49.98	10 14 54.8	0.5	1.9	0.13	9	6 31.7	13 42 8.53	10 1 16.9	0.5	1.8	0 12
25	9 31.2	13 44 42.76	10 14 15.7	0.5	1.9	0.13	10	6 27.7	13 42 9.42	10 1 24.3	0.5	1.8	0.12
26	9 27.1	13 44 35.67	-10 13 37.4	0.5	1.9	0.13	11	6 23.8	13 42 10.50	-10 1 32.8	0.5	1.8	0.12
27	9 23.1	13 44 28.72	10 12 59.8	0.5	1.9	0.13	12	6 19.9	13 42 11.79	10 1 42.5	0.5	1.8	0.12
28	9 19.0	13 44 21.90	10 12 23.0	0.5	1.9	0.13	13	6 16.0	13 42 13.27	10 1 53.3	0.5	1.8	0.12
39	9 15.0	13 44 15.22	10 11 47.1	0.5	1.9	0.13	14	6 12 1	13 42 14.96	10 2 5.2	0.5	1.8	0.12
30	9 11.0	13 44 8.69	10 11 12.0	0.5	1.9	0.13	15	6 8.2	13 42 16.84	10 2 18.2	0.5	1.8	0.12
31	9 6.9	13 44 2.31	-10 10 37.7	0.5	1.9	0.13	16	6 4.3	13 42 18.91	-10 2 32.4	0.5	1.8	0.12
June 1	9 2.9	13 43 56.07	-10 10 4.3	0.5	1.9	0.13	17	6 0.4	13 42 21.18	-10 2 47.6	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	9 25.5	4 11 19.24	+19 25 15.0	0.3	1.3	0.09
2	9 21.5	4 11 13.93	19 25 3.6	0.3	1.3	0.09
3	9 17.5	4 11 8.72	19 24 52.5	0.3	1.3	0.09
4	9 13.5	4 11 3.60	19 24 41.7	0.3	1.3	0.09
5	9 9.5	4 10 58.59	19 24 31.2	0.3	1.3	0.09
6	9 5.4	4 10 53.67	+19 24 21.0	0.3	1.3	0.09
7	9 1.4	4 10 48.86	19 24 11.1	0.3	1.3	0.09
8	8 57.4	4 10 44.14	19 24 1.4	0.3	1.3	0.09
9	8 53.4	4 10 39.53	19 23 52.1	0.3	1.3	0.09
10	8 49.4	4 10 35.04	19 23 43.2	0.3	1.3	0.09
11	8 45.4	4 10 30.66	+19 23 34.5	0.3	1.3	0.09
12	8 41.4	4 10 26 40	19 23 26.2	0.3	1.3	0.09
13	8 37.4	4 10 22.26	19 23 18.3	0.3	1.3	0.09
14	8 33.4	4 10 18.23	19 23 10.7	0.3	1.3	0.09
15	8 29.4	4 10 14.31	19 23 3.4	0.3	1.3	0.09
16	8 25.4	4 10 10.51	+19 22 56.5	0.3	1.3	0.09
17	8 21.4	4 10 6.83	19 22 49.9	0.3	1.3	0.09
18	8 17.4	4 10 3.28	19 22 43.7	0.3	1.3	0.09
19	8 13.4	4 9 59.85	19 22 37.9	0.3	1.3	0.09
20	8 9.5	4 9 56.55	19 22 32.4	0.3	1.3	0.09
21	8 5.5	4 9 53.38	+19 22 27.3	0.3	1.3	0.09
22	8 1.5	4 9 50.33	19 22 22.6	0.3	1.3	0.09
23	7 57.5	4 9 47.41	19 22 18.3	0.3	1.3	0.09
24	7 53.5	4 9 44.62	19 22 14.3	0.3	1.3	0.09
25	7 49.6	4 9 41.96	19 22 10.7	0.3	1.3	0.09
26	7 45.6	4 9 39.44	+19 22 7.4	0.3	1.3	0.09
27	7 41.6	4 9 37.05	19 22 4.5	0.3	1.3	0.09
28	7 37.6	4 9 34.79	19 22 2.0	0.3	1.3	0.09
29	7 33.7	4 9 32.67	19 21 59.9	0.3	1.3	0.09
30	7 29.7	4 9 30.68	19 21 58.1	0.3	1.3	0.09
31	7 25.7	4 9 28.83	+19 21 56.7	0.3	1.3	0.09
Feb. 1	7 21.8	4 9 27.11	19 21 55.7	0.3	1.3	0.09
2	7 17.8	4 9 25.53	19 21 55.1	0.3	1.3	0.09
3	7 13.9	4 9 24.09	19 21 54.8	0.3	1.3	0.09
4	7 9.9	4 9 22.80	19 21 55.0	0.3	1.3	0.09
5	7 6.0	4 9 21.64	+19 21 55.6	0.3	1.3	0.09
6	7 2.0	4 9 20.63	19 21 56.6	0.3	1.3	0.09
7	6 58.1	4 9 19.76	19 21 57.9	0.3	1.3	0.09
8	6 54.1	4 9 19.03	19 21 59.7	0.3	1.3	0.09
9	6 50.2	4 9 18.43	19 22 1.8	0.3	1.3	0.09
10	6 46.2	4 9 17.99	+19 22 4.3	0.3	1.3	0.09
11	6 42.3	4 9 17.70	19 22 7.2	0.3	1.3	0.09
12	6 38.4	4 9 17.54	19 22 10.5	0.3	1.3	0.09
13	6 34.4	4 9 17.53	19 22 14.2	0.3	1.3	0.09
14	6 30.5	4 9 17.66	19 22 18.3	0.3	1.3	0.09
15	6 26.6	4 9 17.94	+19 22 22.8	0.3	1.3	0.09
16	6 22.7	4 9 18.36	+19 22 27.6	0.3	1.3	0.09
Feb. 15	6 26.6	4 9 17.94	+19 22 22.8	0.3	1.3	0.09
16	6 22.7	4 9 18.36	19 22 27.6	0.3	1.3	0.09
17	6 18.7	4 9 18.92	19 22 32.8	0.3	1.3	0.09
18	6 14.8	4 9 19.63	19 22 38.4	0.3	1.3	0.09
19	6 10.9	4 9 20.48	19 22 44.4	0.3	1.3	0.09
20	6 7.0	4 9 21.48	+19 22 50.8	0.3	1.3	0.09
21	6 3.1	4 9 22.61	19 22 57.6	0.3	1.3	0.09
22	5 59.2	4 9 23.89	19 23 4.7	0.3	1.3	0.09
23	5 55.3	4 9 25.31	19 23 12.2	0.3	1.3	0.09
24	5 51.4	4 9 26.87	19 23 20.1	0.3	1.3	0.09
25	5 47.5	4 9 28.57	+19 23 28.3	0.3	1.3	0.09
26	5 43.5	4 9 30.42	19 23 36.9	0.3	1.3	0.09
27	5 39.6	4 9 32.41	19 23 45.9	0.3	1.3	0.09
28	5 35.7	4 9 34.53	19 23 55.2	0.3	1.3	0.09
29	5 31.9	4 9 36.80	19 24 4.9	0.3	1.3	0.09
Sept. 1	17 45.1	4 30 22.91	+20 14 38.4	0.3	1.3	0.09
2	17 41.2	4 30 24.23	20 14 38.2	0.3	1.3	0.09
3	17 37.3	4 30 25.40	20 14 37.8	0.3	1.3	0.09
4	17 33.4	4 30 26.44	20 14 37.0	0.3	1.3	0.09
5	17 29.5	4 30 27.34	20 14 36.0	0.3	1.3	0.09
6	17 25.6	4 30 28.10	+20 14 34.7	0.3	1.3	0.09
7	17 21.7	4 30 28.71	20 14 33.0	0.3	1.3	0.09
8	17 17.7	4 30 29.19	20 14 31.1	0.3	1.3	0.09
9	17 13.8	4 30 29.52	20 14 28.9	0.3	1.3	0.09
10	17 9.9	4 30 29.71	20 14 26.3	0.3	1.3	0.09
11	17 6.0	4 30 29.77	+20 14 23.5	0.3	1.3	0.09
12	17 2.0	4 30 29.69	20 14 20.3	0.3	1.3	0.09
13	16 58.1	4 30 29.47	20 14 16.9	0.3	1.3	0.09
14	16 54.2	4 30 29.11	20 14 13.2	0.3	1.3	0.09
15	16 50.2	4 30 28.60	20 14 9.2	0.3	1.3	0.09
16	16 46.3	4 30 27.96	+20 14 4.9	0.3	1.3	0.09
17	16 42.3	4 30 27.19	20 14 0.4	0.3	1.3	0.09
18	16 38.4	4 30 26.27	20 13 55.5	0.3	1.3	0.09
19	16 34.4	4 30 25.22	20 13 50.4	0.3	1.3	0.09
20	16 30.5	4 30 24.03	20 13 44.9	0.3	1.3	0.09
21	16 26.5	4 30 22.70	+20 13 39.2	0.3	1.3	0.09
22	16 22.6	4 30 21.23	20 13 33.2	0.3	1.3	0.09
23	16 18.6	4 30 19.63	20 13 26.9	0.3	1.3	0.09
24	16 14.6	4 30 17.89	20 13 20.4	0.3	1.3	0.09
25	16 10.7	4 30 16.02	20 13 13.6	0.3	1.3	0.09
26	16 6.7	4 30 14.02	+20 13 6.5	0.3	1.3	0.09
27	16 2.7	4 30 11.88	20 12 59.1	0.3	1.3	0.09
28	15 58.8	4 30 9.61	20 12 51.4	0.3	1.3	0.09
29	15 54.8	4 30 7.20	20 12 43.5	0.3	1.3	0.09
30	15 50.8	4 30 4.65	20 12 35.3	0.3	1.3	0.09
Oct. 1	15 46.8	4 30 1.98	+20 12 26.8	0.3	1.3	0.09
2	15 42.9	4 29 59.18	+20 12 18.1	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	15 46.8	4 30 1.98	+20 12 26.8	0.3	1.3	0.09	Nov. 16	12 42.1	4 26 4.73	+20 2 22.9	0.3	1.3	0.09
2	15 42.9	4 29 59.18	20 12 18.1	0.3	1.3	0.09	17	12 38.0	4 25 57.83	20 2 6.8	0.3	1.3	0.09
3	15 38.9	4 29 56.26	20 12 9.2	0.3	1.3	0.09	18	12 34.0	4 25 50.90	20 1 50.7	0.3	1.3	0.09
4	15 34.9	4 29 53.21	20 12 0.0	0.3	1.3	0.09	19	12 29.9	4 25 43.95	20 1 34.6	0.3	1.3	0.09
5	15 30.9	4 29 50.03	20 11 50.6	0.3	1.3	0.09	20	12 25.9	4 25 36.98	20 1 18.5	0.3	1.3	0.09
6	15 26.9	4 29 46.73	+20 11 40.9	0.3	1.3	0.09	21	12 21.8	4 25 29.97	+20 1 2.4	0.3	1.3	0.09
7	15 22.9	4 29 43.30	20 11 30.9	0.3	1.3	0.09	22	12 17.8	4 25 22.94	20 0 46.2	0.3	1.3	0.09
8	15 19.0	4 29 39.74	20 11 20.7	0.3	1.3	0.09	23	12 13.7	4 25 15.89	20 0 30.1	0.3	1.3	0.09
9	15 15.0	4 29 36.07	20 11 10.3	0.3	1.3	0.09	24	12 9.7	4 25 8.81	20 0 13.9	0.3	1.3	0.09
10	15 11.0	4 29 32.28	20 10 59.7	0.3	1.3	0.09	25	12 5.6	4 25 1.71	19 59 57.7	0.3	1.3	0.09
11	15 7.0	4 29 28.38	+20 10 48.9	0.3	1.3	0.09	26	12 1.6	4 24 54.60	+19 59 41.5	0.3	1.3	0.09
12	15 3.0	4 29 24.36	20 10 37.8	0.3	1.3	0.09	27	11 57.5	4 24 47.49	19 59 25.4	0.3	1.3	0.09
13	14 59.0	4 29 20.23	20 10 26.5	0.3	1.3	0.09	28	11 53.5	4 24 40.38	19 59 9.3	0.3	1.3	0.09
14	14 55.0	4 29 15.98	20 10 15.0	0.3	1.3	0.09	29	11 49.4	4 24 33.27	19 58 53.3	0.3	1.3	0.09
15	14 51.0	4 29 11.61	20 10 3.2	0.3	1.3	0.09	30	11 45.4	4 24 26.15	19 58 37.3	0.3	1.3	0.09
16	14 47.0	4 29 7.13	+20 9 51.3	0.3	1.3	0.09	Dec. 1	11 41.3	4 24 19.03	+19 58 21.3	0.3	1.3	0.09
17	14 42.9	4 29 2.55	20 9 39.1	0.3	1.3	0.09	2	11 37.3	4 24 11.91	19 58 5.3	0.3	1.3	0.09
18	14 38.9	4 28 57.86	20 9 26.8	0.3	1.3	0.09	3	11 33.2	4 24 4.79	19 57 49.5	0.3	1.3	0.09
19	14 34.9	4 28 53.08	20 9 14.3	0.3	1.3	0.09	4	11 29.2	4 23 57.70	19 57 33.7	0.3	1.3	0.09
20	14 30.9	4 28 48.19	20 9 1.6	0.3	1.3	0.09	5	11 25.1	4 23 50.63	19 57 18.1	0.3	1.3	0.09
21	14 26.9	4 28 43.20	+20 8 48.7	0.3	1.3	0.09	6	11 21.1	4 23 43.68	+19 57 2.5	0.3	1.3	0.09
22	14 22.9	4 28 38.11	20 8 35.6	0.3	1.3	0.09	7	11 17.0	4 23 36.54	19 56 47.0	0.3	1.3	0.09
23	14 18.9	4 28 32.91	20 8 22.3	0.3	1.3	0.09	8	11 13.0	4 23 29.53	19 56 31.6	0.3	1.3	0.09
24	14 14.8	4 28 27.61	20 8 8.8	0.3	1.3	0.09	9	11 8.9	4 23 22.54	19 56 16.3	0.3	1.3	0.09
25	14 10.8	4 28 22.23	20 7 55.2	0.3	1.3	0.09	10	11 4.9	4 23 15.57	19 56 1.0	0.3	1.3	0.09
26	14 6.8	4 28 16.76	+20 7 41.4	0.3	1.3	0.09	11	11 0.8	4 23 8.63	+19 55 45.9	0.3	1.3	0.09
27	14 2.8	4 28 11.20	20 7 27.5	0.3	1.3	0.09	12	10 56.8	4 23 1.74	19 55 30.9	0.3	1.3	0.09
28	13 58.8	4 28 5.55	20 7 13.4	0.3	1.3	0.09	13	10 52.7	4 22 54.89	19 55 16.1	0.3	1.3	0.09
29	13 54 7	4 27 59.82	20 6 59.1	0.3	1.3	0.09	14	10 48.7	4 22 48.08	19 55 1.4	0.3	1.3	0.09
30	13 50.7	4 27 54.00	20 6 44.7	0.3	1.3	0.09	15	10 44.6	4 22 41.30	19 54 46.9	0.3	1.3	0.09
31	13 46.7	4 27 48.10	+20 6 30.1	0.3	1.3	0.09	16	10 40.6	4 22 34.57	+19 54 32.5	0.3	1.3	0.09
Nov. 1	13 42.6	4 27 42.11	20 6 15.4	0.3	1.3	0.09	17	10 36.6	4 22 27.89	19 54 18.3	0.3	1.3	0.09
2	13 38.6	4 27 36.05	20 6 0.6	0.3	1.3	0.09	18	10 32.5	4 22 21.25	19 54 4.2	0.3	1.3	0.09
3	13 34.6	4 27 29.92	20 5 45.7	0.3	1.3	0.09	19	10 28.5	4 22 14.66	19 53 50.2	0.3	1.3	0.09
4	13 30.5	4 27 23.73	20 5 30.6	0.3	1.3	0.09	20	10 24.4	4 22 8.14	19 53 36.5	0.3	1.3	0.09
5	13 26.5	4 27 17.47	+20 5 15.4	0.3	1.3	0.09	21	10 20.4	4 22 1.67	+19 53 23.0	0.3	1.3	0.09
6	13 22.5	4 27 11.14	20 5 0.1	0.3	1.3	0.09	22	10 16.4	4 21 55.27	19 53 9.6	0.3	1.3	0.09
7	13 18.4	4 27 4.74	20 4 44.8	0.3	1.3	0.09	23	10 12.3	4 21 48.94	19 52 56.4	0.3	1.3	0.09
8	13 14.4	4 26 58.27	20 4 29.3	0.3	1.3	0.09	24	10 8.3	4 21 42.67	19 52 43.4	0.3	1.3	0.09
9	13 10.4	4 26 51.74	20 4 13.7	0.3	1.3	0.09	25	10 4.2	4 21 36.46	19 52 30.7	0.3	1.3	0.09
10	13 6.3	4 26 45.17	+20 3 58.1	0.3	1.3	0.09	26	10 0.2	4 21 30.31	+19 52 18.1	0.3	1.3	0.09
11	13 2.3	4 26 38.55	20 3 42.4	0.3	1.3	0.09	27	9 56.2	4 21 24.25	19 52 5.7	0.3	1.3	0.09
12	12 58.2	4 26 31.88	20 3 26.6	0.3	1.3	0.09	28	9 52.2	4 21 18.26	19 51 53.6	0.3	1.3	0.09
13	12 54.2	4 26 25.16	20 3 10.8	0.3	1.3	0.09	29	9 48.1	4 21 12.36	19 51 41.7	0.3	1.3	0.09
14	12 50.2	4 26 18.40	20 2 54.9	0.3	1.3	0.09	30	9 44.1	4 21 6.54	19 51 30.0	0.3	1.3	0.09
15	12 46.1	4 26 11.59	+20 2 39.0	0.3	1.3	0.09	31	9 40.1	4 21 0.81	+19 51 18.6	0.3	1.3	0.09
16	12 42.1	4 26 4.73	+20 2 22.9	0.3	1.3	0.09	32	9 36.1	4 20 55.16	+19 51 7.4	0.3	1.3	0.09

PART III

PHENOMENA

ECLIPSES IN 1891.

In the year 1891 there will be four eclipses, two of the sun and two of the moon, and a Transit of Mercury over the Sun's Disk.

I.—*A Total Eclipse of the Moon*, 1891, May 23, invisible at Washington, but visible generally throughout the western part of the Pacific Ocean, Australia, Asia, Africa and Europe.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, May 23ᵈ 6ʰ 18ᵐ 53.7ˢ

	h m s		s
Sun's right ascension	4 0 49.54	Hourly motion	10.06
Moon's right ascension	16 0 49.54	Hourly motion	133.91
	° ′ ″		′ ″
Sun's declination	20 37 56.2 N.	Hourly motion	0 28.5 N.
Moon's declination	20 20 12.7 S.	Hourly motion	9 24.1 S.
Sun's equa. hor. parallax	8.5	Sun's true semidiameter	15 47.5
Moon's equa. hor. parallax	56 47.1	Moon's true semidiameter	15 27.7

TIMES OF THE PHASES.

		d h m	
Moon enters penumbra	May	23 3 33.1	Greenwich Mean Time.
Moon enters shadow		23 4 41.3	
Total eclipse begins		23 5 49.3	
Middle of the eclipse		23 6 29.2	
Total eclipse ends		23 7 9.1	
Moon leaves shadow		23 8 17.3	
Moon leaves penumbra		23 9 23.0	

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and in latitude.	
First	125° to E.	107° 58′ E.	20° 5′ S.
Last	90 to W.	55 49 E.	20 39 S.

Magnitude of the eclipse = 1.306, (moon's diameter = 1).

II.—*An Annular Eclipse of the Sun*, 1891, June 6, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, June 6ᵈ 4ʰ 37ᵐ 58.6ˢ

	h m s		s s
Sun and moon's R. A.	4 57 37.39	Hourly motions	10.31 and 143.97
	° ′ ″		′ ″
Sun's declination	22 40 47.4 N.	Hourly motion	0 15.4 N.
Moon's declination	23 37 57.8 N.	Hourly motion	6 36.3 N.
Sun's equa. hor. parallax	8.4	Sun's true semidiameter	15 45.5
Moon's equa. hor. parallax	57 32.1	Moon's true semidiameter	15 39.9

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time. d h m	Longitude from Greenwich.	Latitude.
Eclipse begins	June	6 2 3.3	132° 32.0′ W.	25° 8.3′ N.
Central eclipse begins		6 3 52.6	170 19.5 E.	57 34.5 N.
Central eclipse at noon		6 4 38.0	110 6.6 E.	69 50.2 N.
Central eclipse ends		6 4 38.5	109 17.6 E.	67 19.3 N.
Eclipse ends		6 6 27.8	18 7.2 E.	45 48.7 N.

III.—*A Total Eclipse of the Moon*, 1891, November 15, visible at Washington, and generally visible in Asia, Africa, Europe, the Atlantic Ocean, North and South America, and the eastern part of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, November 15ᵈ 12ʰ 8ᵐ 44ˢ.8

	h m s		s
Sun's right ascension	15 23 54.99	Hourly motion	10.29
Moon's right ascension	3 23 54.99	Hourly motion	145.10
Sun's declination	18° 37′ 41″.1 S.	Hourly motion	0′ 37″.9 S.
Moon's declination	18 21 5.5 N.	Hourly motion	12 23.6 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	16 10.9
Moon's equa. hor. parallax	60 3.2	Moon's true semidiameter	16 21.1

TIMES OF THE PHASES.

		d h m	
Moon enters penumbra	November	15 9 35.9	Greenwich Mean Time.
Moon enters shadow		15 10 35.0	
Total eclipse begins		15 11 37.0	
Middle of the eclipse		15 12 18.8	
Total eclipse ends		15 13 0.7	
Moon leaves shadow		15 14 3.0	
Moon leaves penumbra		15 15 2.6	

CIRCUMSTANCES OF THE ECLIPSE.

Contacts of Shadow with moon's limb.	Angles of position from north point.	The moon being in the zenith in longitude from Greenwich and in latitude.	
First	55° to E.	16° 34′ E.	18° 2′ N.
Last	95 to W.	33 32 W.	18 43 N.

Magnitude of the eclipse = 1.393, (moon's diameter = 1).

IV.—*A Partial Eclipse of the Sun*, 1891, November 30—December 1, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, 1891, December 1ᵈ 0ʰ 7ᵐ 46ˢ.9

	h m s		s s
Sun and moon's R. A.	16 29 22.94	Hourly motions	10.80 and 134.25
Sun's declination	21° 49′ 15″.7 S.	Hourly motion	0′ 23″.3 S.
Moon's declination	23 1 22.9 S.	Hourly motion	7 40.7 S.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	16 13.7
Moon's equa. hor. parallax	55 56.9	Moon's true semidiameter	15 14.0

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	Longitude from Greenwich.	Latitude.
Eclipse begins	November	30 21 44.3	75° 31′.5 W.	35° 45′.0 S.
Greatest eclipse		30 23 31.2	141 0.9 W.	64 6.5 S.
Eclipse ends	December	1 1 17.8	110 7.6 E.	59 14.0 S.

Magnitude of greatest eclipse = 0.531, (sun's diameter = 1).

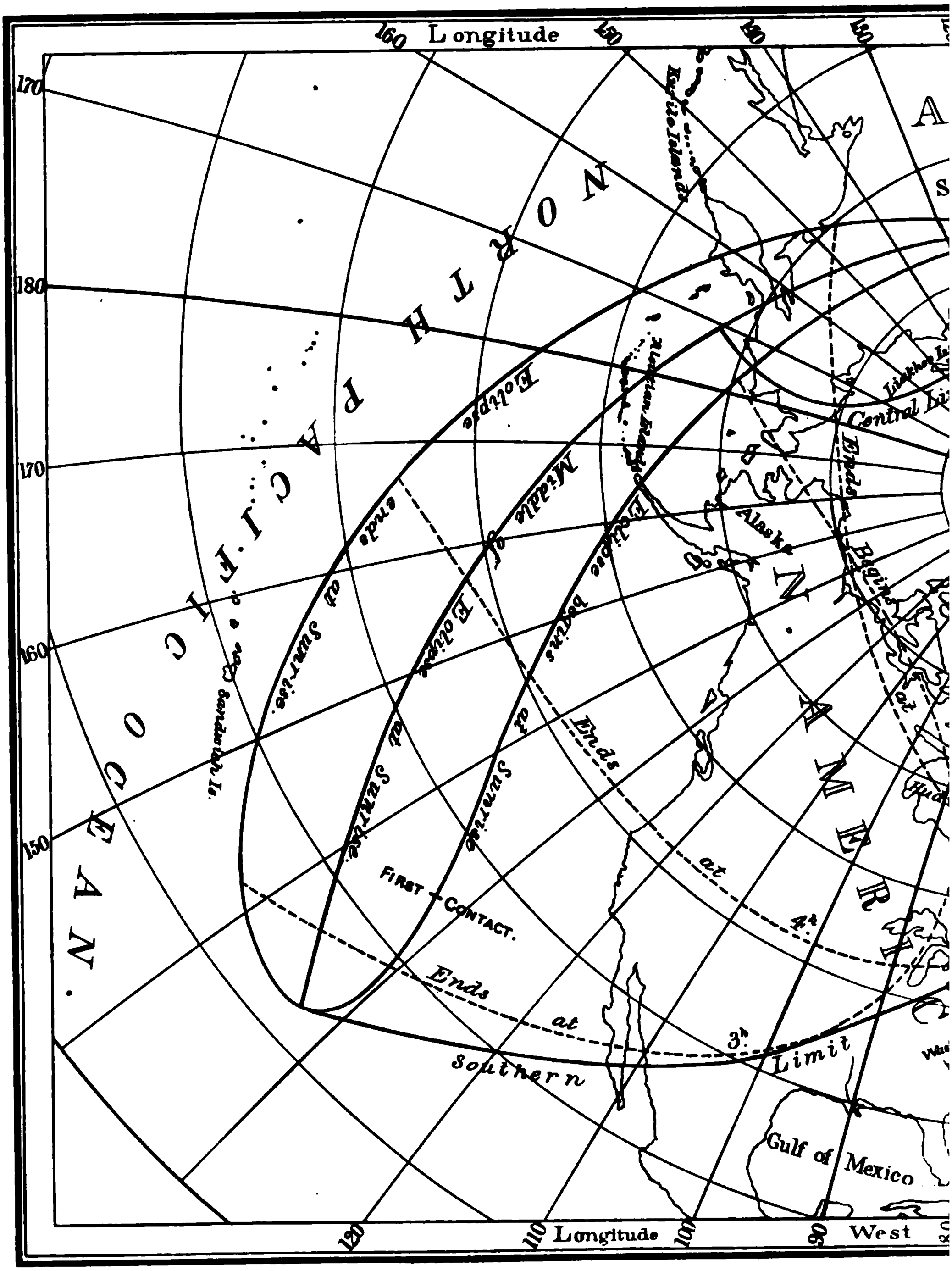
The regions within which the eclipses of the sun are visible, are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich times of beginning and ending, within fifteen or twenty minutes, may also be found.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1891, JUNE 6.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l′*
h m					° ′		
2 0	−1.40416	+0.70249	+9.58588	+9.96509	30 23.8	+0.54712	+0.00124
10	1.31529	0.72116	9.58589	9.96509	32 53.8	0.54715	0.00127
20	1.22642	0.73982	9.58591	9.96509	35 23.8	0.54717	0.00129
30	1.13755	0.75847	9.58592	9.96508	37 53.8	0.54720	0.00132
40	1.04868	0.77711	9.58593	9.96508	40 23.8	0.54722	0.00134
50	0.95980	0.79574	9.58594	9.96508	42 53.8	0.54725	0.00137
3 0	−0.87092	+0.81435	+9.58595	+9.96508	45 23.7	+0.54727	+0.00139
10	0.78204	0.83295	9.58597	9.96507	47 53.7	0.54730	0.00142
20	0.69316	0.85154	9.58598	9.96507	50 23.7	0.54732	0.00144
30	0.60427	0.87012	9.58599	9.96507	52 53.7	0.54735	0.00147
40	0.51538	0.88870	9.58600	9.96507	55 23.7	0.54737	0.00149
50	0.42649	0.90727	9.58601	9.96507	57 53.7	0.54739	0.00151
4 0	−0.33760	+0.92582	+9.58603	+9.96506	60 23.7	+0.54741	+0.00153
10	0.24871	0.94436	9.58604	9.96506	62 53.7	0.54743	0.00155
20	0.15982	0.96289	9.58605	9.96506	65 23.7	0.54745	0.00157
30	−0.07093	0.98141	9.58606	9.96506	67 53.7	0.54747	0.00159
40	+0.01797	0.99992	9.58607	9.96506	70 23.7	0.54749	0.00161
50	0.10687	1.01842	9.58609	9.96505	72 53.7	0.54751	0.00163
5 0	+0.19577	+1.03690	+9.58610	+9.96505	75 23.7	+0.54752	+0.00164
10	0.28466	1.05538	9.58611	9.96505	77 53.7	0.54754	0.00166
20	0.37356	1.07385	9.58612	9.96505	80 23.7	0.54755	0.00167
30	0.46246	1.09231	9.58613	9.96504	82 53.7	0.54757	0.00169
40	0.55135	1.11075	9.58615	9.96504	85 23.7	0.54758	0.00170
50	0.64025	1.12918	9.58616	9.96504	87 53.7	0.54760	0.00172
6 0	+0.72914	+1.14760	+9.58617	+9.96504	90 23.6	+0.54761	+0.00173
10	0.81803	1.16601	9.58618	9.96504	92 53.6	0.54763	0.00175
20	0.90692	1.18440	9.58619	9.96503	95 23.6	0.54764	0.00176
30	+0.99581	+1.20278	+9.58621	+9.96503	97 53.6	+0.54765	+0.00177

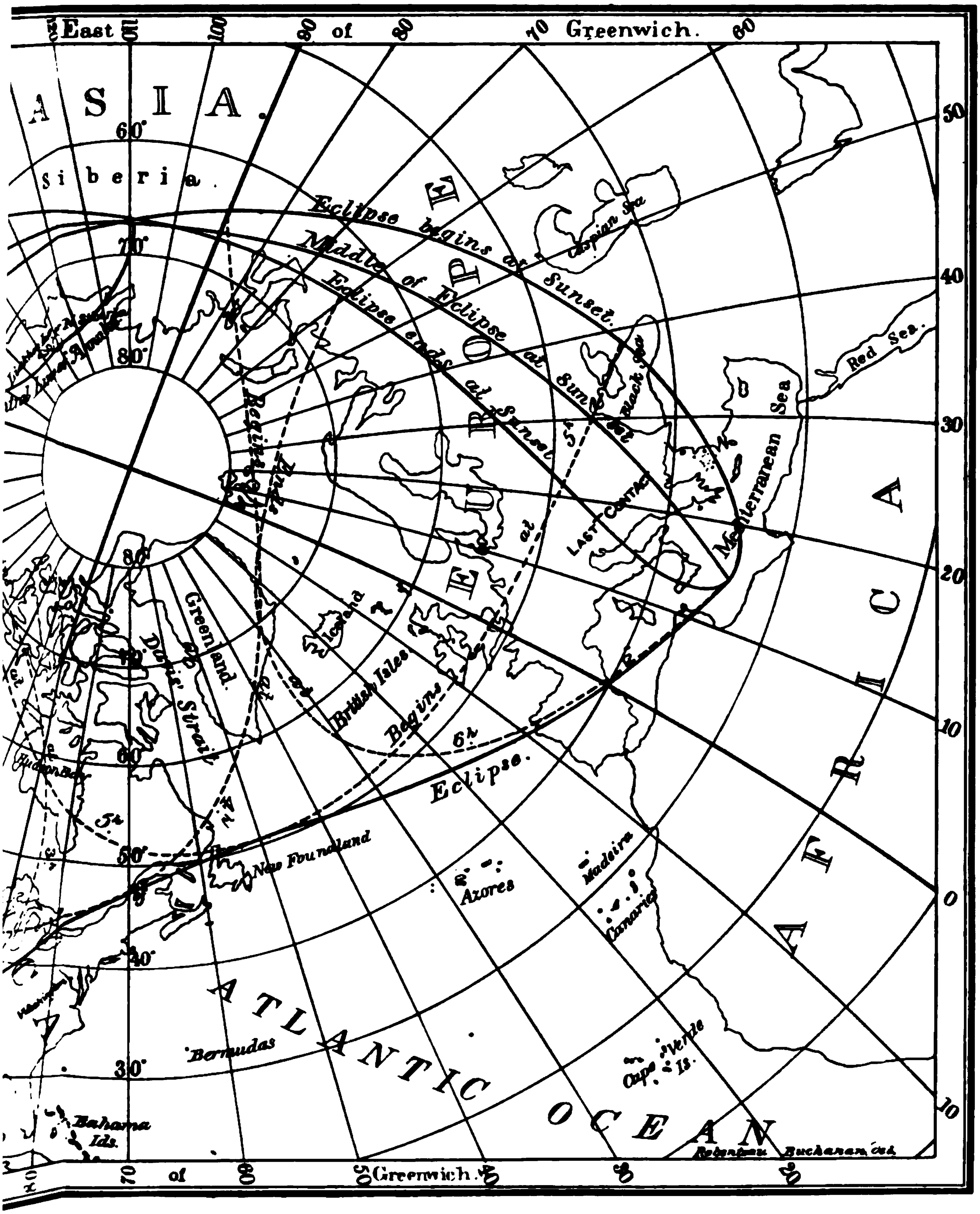
Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
2 0	+7.9487	+7.2713	+1.1761	+7.66336	+7.66125
3 0	7.9488	7.2697	1.1761	7.66336	7.66124
4 0	7.9488	7.2682	1.1761	7.66336	7.66124
5 0	7.9489	7.2667	1.1761	7.66335	7.66124
6 0	7.9488	7.2652	1.1761	7.66335	7.66124
7 0	+7.9488	+7.2635	+1.1761	+7.66335	+7.66124

ANNULAR ECLIPS



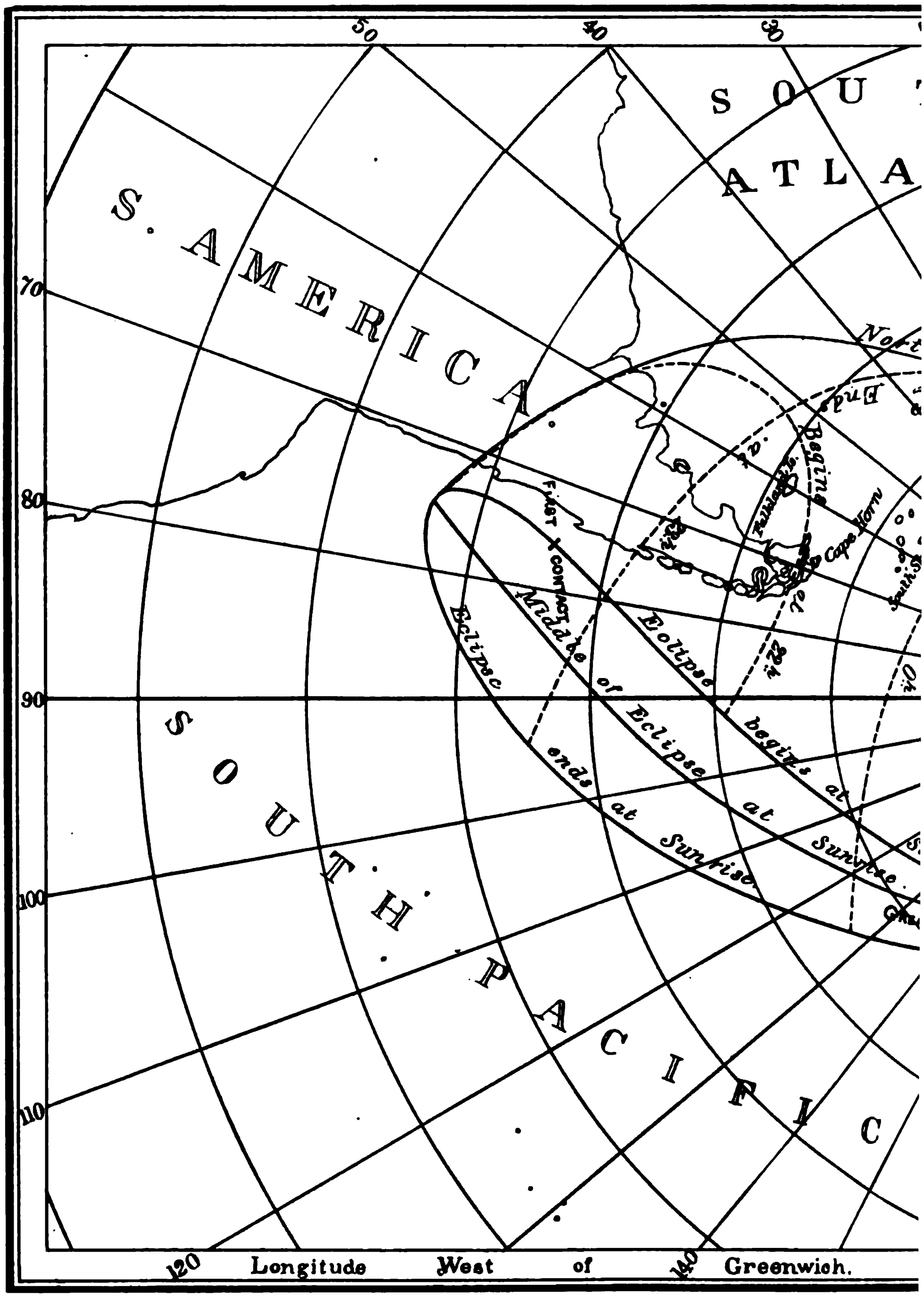
Note.-*The hours of beginning an*

IPSE OF JUNE 6TH 1891.



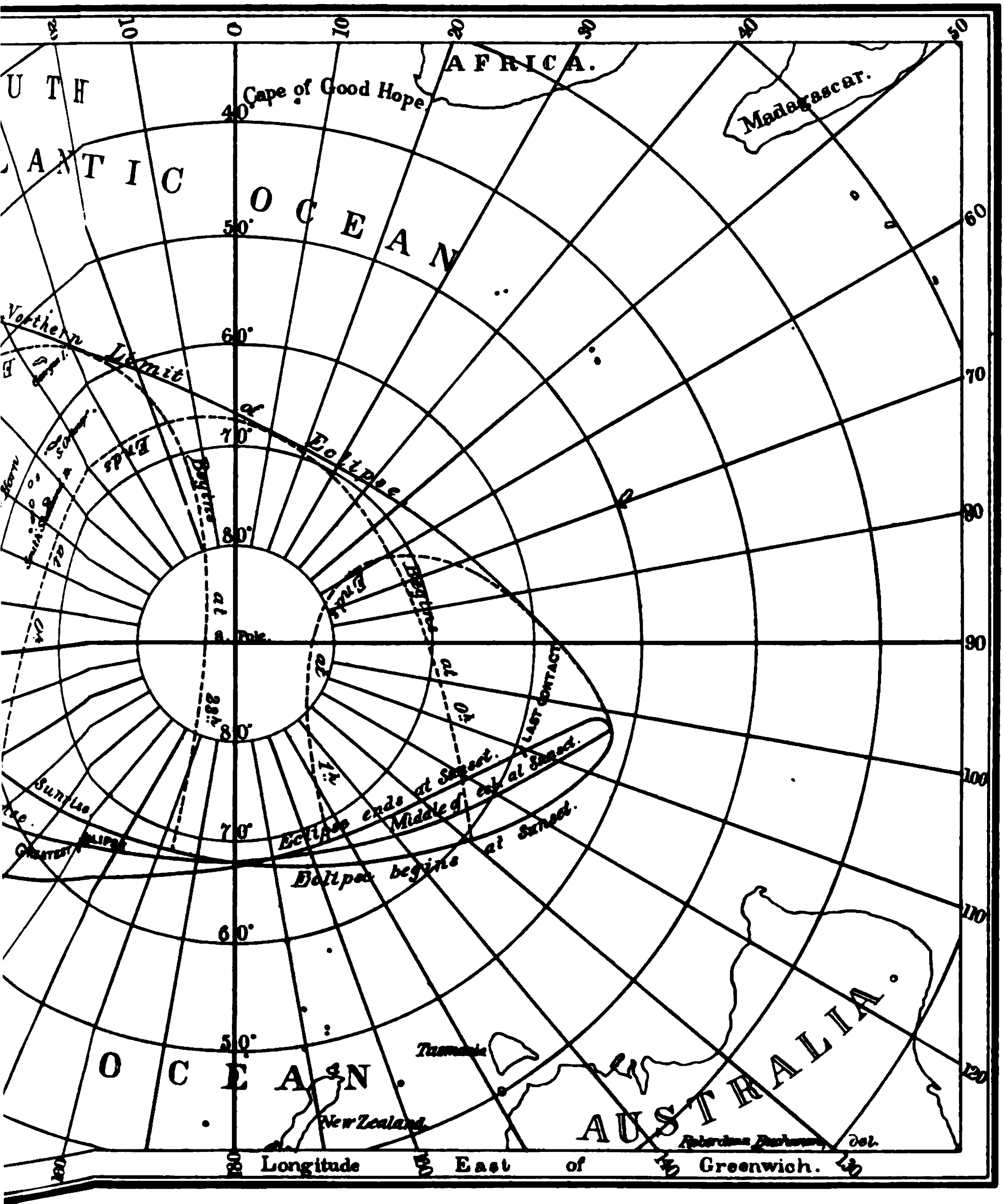
and ending are expressed in Greenwich Mean Time.

PARTIAL ECLIPSE



Note.– *The hours of beginning*

SE OF NOV. 30TH – DEC. 1ST 1891.



nning and ending are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN, 1891, NOVEMBER 30—DECEMBER 1.

Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	Log sin d	Log cos d	μ	l
h m					° ′	
21 40	−1.25340	−0.97072	−9.56985	+9.96777	327 43.3	+0.56395
50	1.16861	0.99256	9.56987	9.96777	330 13.3	0.56394
22 0	−1.08382	−1.01439	−9.56989	+9.96776	332 43.3	+0.56394
10	0.99902	1.03620	9.56991	9.96776	335 13.3	0.56393
20	0.91422	1.05800	9.56993	9.96776	337 43.2	0.56391
30	0.82942	1.07979	9.56995	9.96775	340 13.2	0.56390
40	0.74461	1.10158	9.56997	9.96775	342 43.2	0.56388
50	0.65980	1.12336	9.56999	9.96775	345 13.2	0.56387
23 0	−0.57499	−1.14512	−9.57001	+9.96774	347 43.1	+0.56385
10	0.49017	1.16687	9.57003	9.96774	350 13.1	0.56384
20	0.40535	1.18861	9.57005	9.96774	352 43.1	0.56382
30	0.32052	1.21034	9.57007	9.96773	355 13.1	0.56381
40	0.23569	1.23207	9.57009	9.96773	357 43.0	0.56379
50	0.15086	1.25379	9.57011	9.96773	0 13.0	0.56377
0 0	−0.06603	−1.27549	−9.57013	+9.96772	2 43.0	+0.56375
10	+0.01881	1.29718	9.57015	9.96772	5 12.9	0.56373
20	0.10365	1.31885	9.57017	9.96772	7 42.9	0.56371
30	0.18850	1.34051	9.57018	9.96771	10 12.9	0.56369
40	0.27335	1.36216	9.57020	9.96771	12 42.9	0.56367
50	0.35821	1.38380	9.57022	9.96771	15 12.8	0.56365
1 0	+0.44307	−1.40543	−9.57024	+9.96770	17 42.8	+0.56362
10	0.52793	1.42704	9.57026	9.96770	20 12.8	0.56360
20	+0.61279	−1.44864	−9.57028	+9.96770	22 42.8	+0.56357

Greenwich Mean Time.		Log Δ x for 1 Minute.	Log Δ y for 1 Minute.	Log Δ μ for 1 Minute.	Log Tangent of Angle of Cone—
h	m				Penumbra.
21	0	+7.9282	−7.3400	+1.1760	+7.67616
22	0	7.9284	7.3388	1.1760	7.67616
23	0	7.9285	7.3376	1.1760	7.67616
0	0	7.9286	7.3363	1.1760	7.67616
1	0	7.9287	7.3349	1.1760	7.67616
2	0	+7.9288	−7.3336	+1.1760	+7.67617

A Transit of Mercury over the Sun's Disk, May 9, partly visible at Washington, and visible throughout the western portion of North and South America.

ELEMENTS OF THE TRANSIT.

Greenwich mean time of ☌ in right ascension, May $9^{d}\ 15^{h}\ 57^{m}\ 22^{s}.9$

Sun and Mercury's R. A.	$3^{h}\ 6^{m}\ 57^{s}.16$	Hourly motions	$+2'\ 26''.20$ and $-1'\ 18''.5$
Sun's declination	$+17°\ 32'\ 1''.3$	Hourly motion	$+\ 39''.56$
Mercury's declination	$+17\ 18\ 1.6$	Hourly motion	$-\ 66.65$
Sun's equa. hor. parallax	8.75	True semidiameter	$15'\ 52''.3$
Mercury's equa. hor. parallax	15.86	True semidiameter	6.0

TIMES OF THE PHASES.

		d	h	m	s	
Ingress, exterior contact	May	9	11	55	29.3	Greenwich Mean Time.
Ingress, interior contact		9	12	0	25.0	
Least distance of centres 12′ 32″.4		9	14	23	54.5	
Egress, interior contact		9	16	47	2.3	
Egress, exterior contact		9	16	52	45.7	

CIRCUMSTANCES OF THE TRANSIT.

Exterior contacts.	Angles of position from north point.	The sun being in the zenith in longitude from Greenwich and in latitude.	
Ingress	115° 31′ E.	179° 48′ W.	17° 36′ N.
Egress	168 15 W.	105 53 E.	17 39 N.

The Washington mean time of exterior contact at Ingress and Egress for any point on the surface of the earth, may be computed from the following formulæ, in which ρ denotes the radius of the earth at the place, φ the geocentric north latitude and ω the longitude *west* from Washington.

Ingress, $T' = 6^{h}\ 47^{m}\ 17^{s}.26 + 71^{s}.66\ \rho \sin \varphi - 157^{s}.88\ \rho \cos \varphi \cos (\ 20°\ 16'\ 55''.5 - \omega\ )$

Egress, $T'' = 11\ 44\ 33.69 - 162.30\ \rho \sin \varphi + 60.75\ \rho \cos \varphi \cos (212\ 37\ 51.3 - \omega\ )$

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	9	22	16.4	January	16	13	9.3	January	24	7	17.1	January	2	17	4.0
February	8	9	4.0	February	15	1	21.3	February	23	2	10.2	February	1	11	33.9
March	9	18	42.5	March	16	16	2.3	March	24	20	3.7	March	3	2	29.3
April	8	3	48.8	April	15	8	32.2	April	23	11	57.0	April	1	13	22.1
May	7	13	7.3	May	15	1	56.2	May	23	1	17.7	April	30	20	42.9
June	5	23	18.0	June	13	19	25.7	June	21	12	3.9	May	30	1	46.2
July	5	10	50.3	July	13	12	20.7	July	20	20	45.9	June	28	6	7.7
August	4	0	4.0	August	12	4	3.5	August	19	4	20.1	July	27	11	24.4
September	2	15	7.8	September	10	17	59.3	September	17	11	55.6	August	25	19	1.0
October	2	7	49.6	October	10	5	48.5	October	16	20	36.8	September	24	5	59.0
November	1	1	24.4	November	8	15	38.2	November	15	7	7.9	October	23	20	47.9
November	30	18	36.8	December	8	0	5.0	December	14	19	44.4	November	22	15	17.7
December	30	10	11.6									December	22	12	30.4

PERIGEE, APOGEE, AND GREATEST LIBRATION.

Perigee.			Apogee.			Greatest Libration.									
	d	h		d	h		d	h	m			d	h	m	
January	11	8.7	January	26	22.7	January	5	12	7	E.	January	17	13	0	W.
February	8	19.2	February	23	0.9	February	2	21	4	E.	February	14	14	23	W.
March	9	7.6	March	22	4.6	March	3	3	17	E.	March	15	6	12	W.
April	6	17.1	April	18	18.3	March	31	1	12	E.	April	12	11	48	W.
May	4	15.5	May	16	11.8	April	27	0	36	E.	May	10	11	2	W.
May	31	3.5	June	13	6.9	May	23	7	36	E.	June	6	21	54	W.
June	25	11.7	July	11	1.3	June	19	10	9	E.	July	3	12	36	W.
July	22	23.9	August	7	17.1	July	17	4	8	E.	July	30	0	16	W.
August	20	3.8	September	4	3.1	August	14	6	18	E.	August	26	13	14	W.
September	17	13.3	October	1	4.7	September	11	12	7	E.	September	23	14	57	W.
October	16	0.3	October	28	11.6	October	9	21	8	E.	October	21	21	28	W.
November	13	8.1	November	25	3.7	November	6	9	58	E.	November	19	2	8	W.
December	11	1.0	December	23	0.9	December	2	19	59	E.	December	16	23	10	W.
						December	29	8	22	E.					

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($= 1^\circ\ 28'.8$),

Ω, the mean longitude of the moon's ascending node, (see page 278), or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, α', δ', the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, Ω,

i, Δ, Ω', ☾, the quantities defined on page 276, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 276 and 277: —

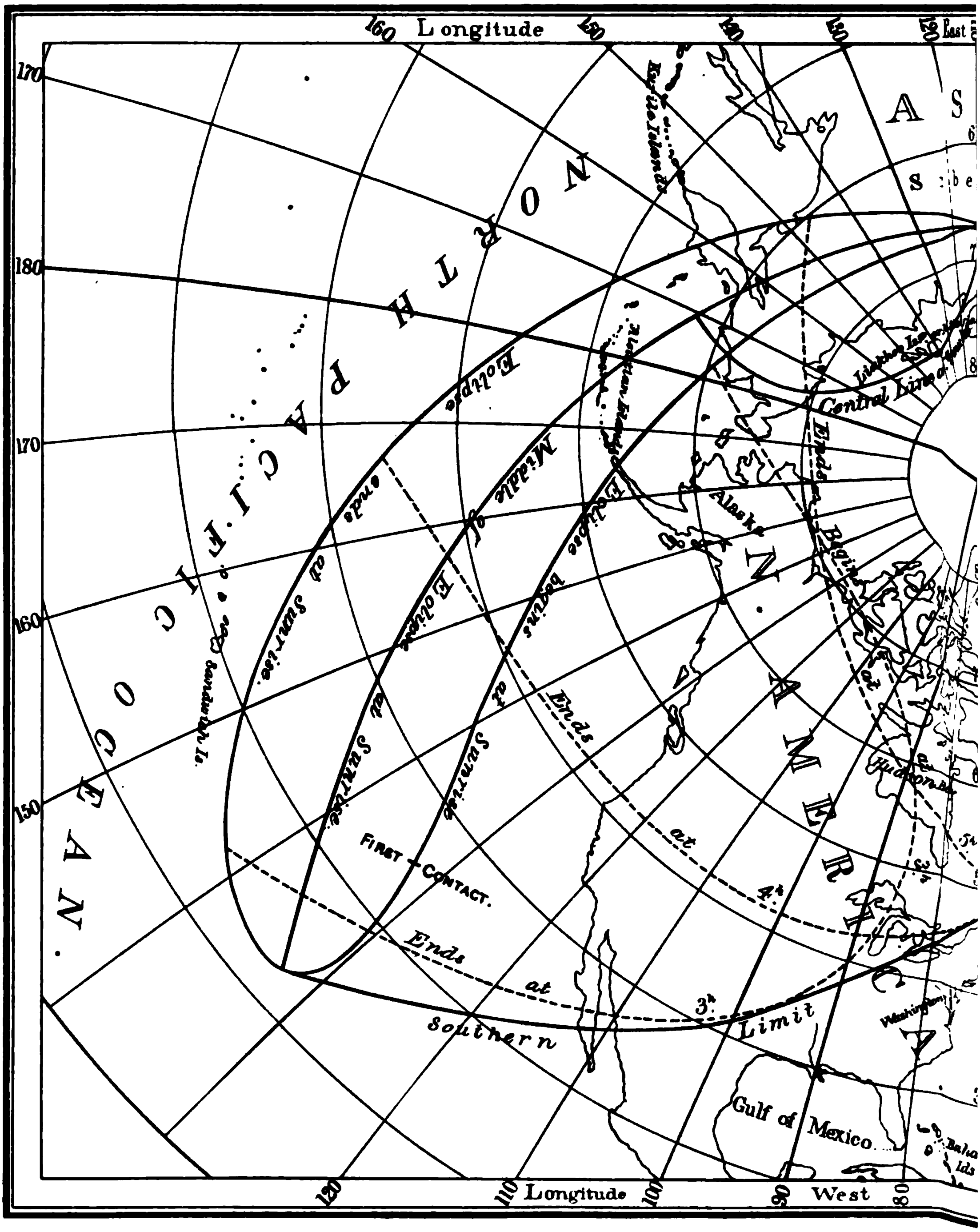
$$\left.\begin{aligned} \Delta\lambda &= -\,0'.57 \sin 2\,(\Omega - \lambda) \\ a &= \sin I \cos\,(\Omega - \lambda) \\ \tan B &= \tan I \sin\,(\Omega - \lambda) \\ \lambda' &= \lambda + \Delta\lambda + a\,b \end{aligned}\right\}\ \textit{See table, page 277.}$$

$$\text{The libration in latitude} = b = B - \beta$$

$$\text{The libration in longitude} = l = \lambda' - \text{☾}$$

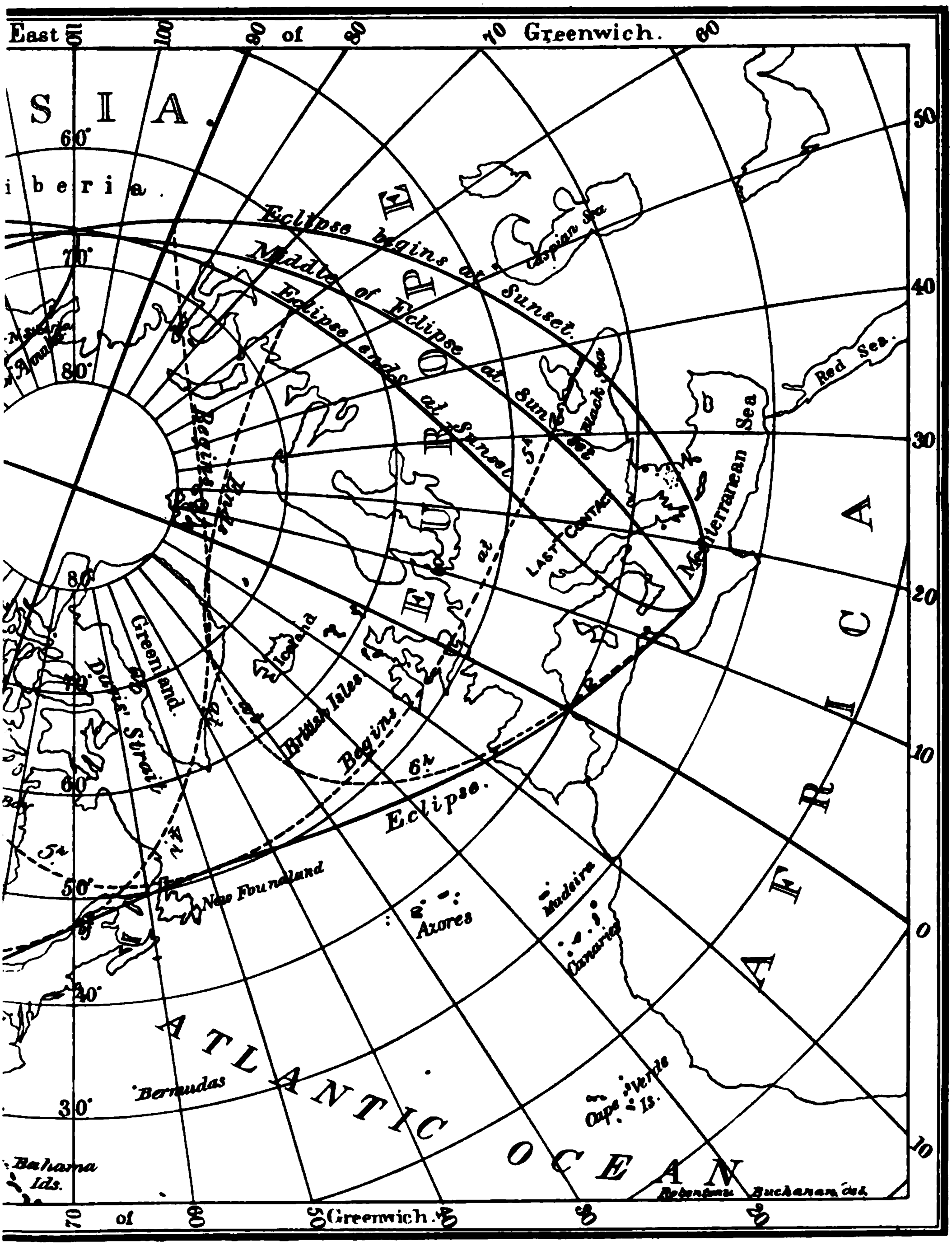
$$\sin C = \sin i\,\frac{\cos\,(\lambda' + \Delta - \Omega)}{\cos \delta'} = -\sin i\,\frac{\cos\,(\alpha' - \Omega)}{\cos b}$$

ANNULAR ECLIPSE OF



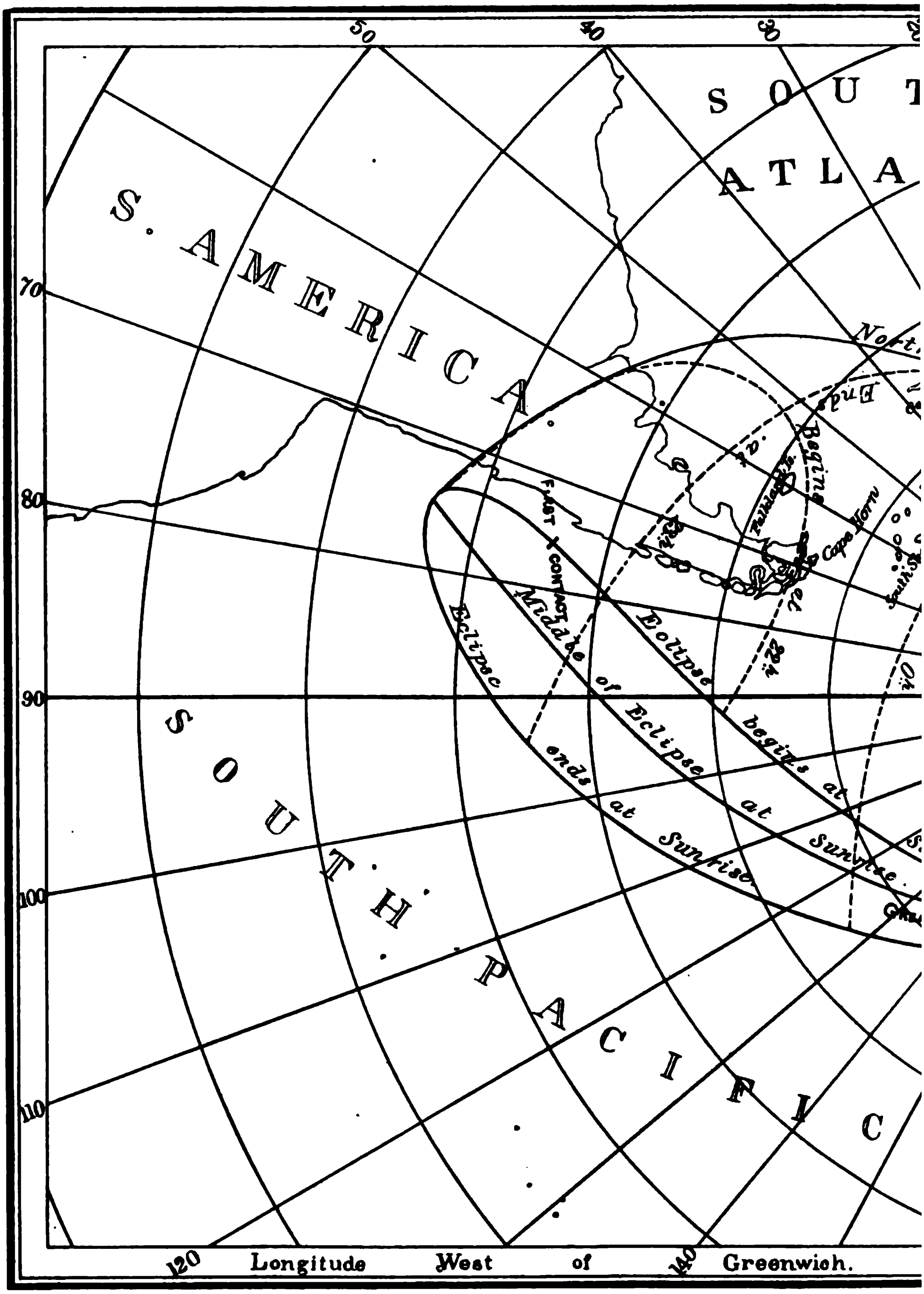
Note.-*The hours of beginning and ending ar*

E OF JUNE 6TH 1891.



ng are expressed in Greenwich Mean Time.

PARTIAL ECLIPSE



Note.—*The hours of beginning*

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
χ Capricorni	5.4	-1.51	-8.2	-21 38.1	7 7 1.2	+ 9 0.6	+0.1038	0.5954	+0.1511	+33	-36
27 Capricorni	6.5	1.51	8.4	20 59.8	7 24.3	+ 9 22.7	-0.4678	0.5954	0.1517	+ 4	-72
φ Capricorni	5.5	1.52	8.5	21 6.5	9 46.1	+11 38.8	+0.0083	0.5940	0.1582	+28	-41
33 Capricorni	5.7	1.53	8.6	21 19.1	13 5.3	- 9 10.1	+0.7519	0.5925	0.1660	+66	+ 1
37 Capricorni	6.0	1.55	9.0	20 34.4	17 17.1	- 5 8.3	+0.7377	0.5906	0.1761	+69	- 1
ε Capricorni	4.7	-1.54	-9.1	-19 57.5	18 10.0	- 4 17.5	+0.2885	0.5905	+0.1780	+46	-26
κ Capricorni	5.0	1.54	9.3	-19 21.9	20 21.6	- 2 11.2	+0.1000	0.5899	0.1835	+36	-36
				NEW	*MOON.*						
26 Ceti	5.9	1.51	9.2	+ 0 46.9	11 9 23.5	+ 7 43.1	+0.9933	0.5536	0.2656	+90	+12
29 Ceti	6.3	-1.51	-9.0	+ 1 25.3	11 15.1	+ 9 30.8	+0.8547	0.5539	+0.2654	+90	+ 5
33 Ceti	6.1	1.50	8.9	1 51.9	12 18.6	+10 32.0	+0.7226	0.5533	0.2647	+90	- 4
35 Ceti	6.3	1.50	8.9	1 53.6	13 17.0	+11 28.5	+0.9272	0.5531	0.2643	+90	+ 9
f Piscium	5.1	1.49	8.5	3 2.3	15 38.1	-10 15.4	+0.4148	0.5531	0.2634	+66	-20
μ Piscium	5.0	1.48	7.8	5 34.7	21 8.6	- 4 56.1	-0.6650	0.5527	0.2605	+ 7	-83
ν Piscium	4.6	-1.44	-7.7	+ 4 56.1	12 2 12.6	- 0 2.6	+1.2870	0.5518	+0.2569	+90	+38
ξ Arietis	5.3	1.34	5.4	10 6.9	21 37.7	- 5 17.5	+0.9276	0.5511	0.2380	+90	+12
B. A. C. 755	6.5	1.34	5.3	10 4.3	22 30.0	- 4 27.1	+1.1790	0.5507	0.2370	+90	+30
31 Arietis	5.7	1.32	4.5	11 58.4	13 2 53.0	- 0 12.9	+0.2850	0.5514	0.2315	+58	-23
38 Arietis	5.0	1.29	4.3	11 59.1	6 37.0	+ 3 23.5	+1.1350	0.5521	0.2268	+90	+28
σ Arietis	5.5	-1.29	-3.3	+14 37.9	9 30.1	+ 6 10.6	-0.9067	0.5524	+0.2227	- 8	-75
13 Tauri	5.7	1.11	0.4	19 21.0	14 7 58.2	+ 3 52.0	-1.1570	0.5551	0.1854	-30	-72
14 Tauri	6.3	1.10	-0.3	19 19.2	8 37.0	+ 4 29.3	-1.0060	0.5550	0.1842	-17	-71
B. A. C. 1242	6.3	1.02	+0.3	19 53.6	16 13.5	+11 49.9	-0.2577	0.5558	0.1695	+27	-45
ω^1 Tauri	6.0	0.97	0.3	19 19.2	19 45.6	- 8 45.5	+0.9270	0.5569	0.1626	+90	+21
NEPTUNE				+19 26.9	23 4.5	- 5 34.0	+1.3210	0.5563	+0.1556	+90	+63
ω^2 Tauri	5.7	-0.93	+0.9	20 18.6	23 17.4	- 5 21.2	+0.4574	0.5572	0.1551	+71	- 6
51 Tauri	6.0	0.94	1.2	21 18.8	23 45.7	- 4 54.2	-0.5183	0.5572	0.1541	+13	-59
53 Tauri	6.0	0.93	1.1	20 52.7	15 0 13.5	- 4 27.1	+0.0070	0.5578	0.1533	+42	-28
56 Tauri	6.0	0.93	1.3	21 30.6	0 17.5	- 4 23.3	-0.6428	0.5578	0.1533	+ 6	-66
κ^1 Tauri	4.7	-0.91	+1.6	+22 2.6	2 47.4	- 1 58.7	-0.8239	0.5578	+0.1476	- 5	-68
κ^2 Tauri	6.3	0.91	1.6	21 57.0	2 49.0	- 1 57.3	-0.7242	0.5584	0.1478	+ 1	-68
B. A. C. 1373	6.0	0.89	1.5	21 22.4	3 57.4	- 0 51.1	+0.0471	0.5584	0.1454	+45	-25
τ Tauri	4.5	0.82	2.2	22 44.9	10 8.0	+ 5 6.1	-0.5412	0.5585	0.1317	+12	-58
99 Tauri	6.0	0.73	3.1	23 46.6	16 52.2	+11 36.1	-0.7887	0.5598	0.1167	- 4	-66
103 Tauri	6.0	-0.67	+3.2	+24 7.2	21 19.8	- 8 6.0	-0.6561	0.5593	+0.1066	+ 5	-63
118 Tauri	5.7	0.55	4.1	25 3.7	16 6 28.7	+ 0 43.3	-0.7852	0.5604	0.0850	- 4	-65
121 Tauri	6.0	0.50	3.8	23 57.9	9 10.7	+ 3 19.4	+0.6049	0.5604	0.0787	+86	+10
132 Tauri	5.3	0.41	4.4	24 31.8	15 2.7	+ 8 58.9	+0.4250	0.5599	0.0645	+70	+ 3
139 Tauri	5.3	0.36	4.9	25 56.4	18 54.4	-11 17.7	-0.8588	0.5597	0.0554	- 9	-64
5 Geminorum	6.7	-0.28	+4.5	+24 26.7	17 0 49.6	- 5 35.2	+1.0340	0.5591	+0.0407	+90	+40
ε Geminorum	3.2	0.07	4.7	25 14.3	14 57.7	+ 8 2.9	+0.5171	0.5569	+0.0067	+77	+12
37 Geminorum	6.3	-0.01	4.6	25 30.7	19 58.1	-11 7.3	+0.2265	0.5555	-0.0054	+55	- 3
39 Geminorum	6.3	+0.01	4.9	26 13.4	21 29.8	- 9 38.8	-0.5580	0.5546	0.0090	+10	-49
40 Geminorum	6.3	0.02	4.9	26 3.8	21 47.3	- 9 21.9	-0.3877	0.5546	0.0096	+20	-37
52 Geminorum	6.3	+0.11	+4.4	+25 4.4	18 4 34.0	- 2 49.4	+0.5710	0.5530	-0.0256	+83	+13
A Geminorum	5.7	0.16	4.4	25 15.5	8 29.4	+ 0 57.8	+0.2496	0.5514	0.0348	+57	- 5
c Geminorum	6.0	0.29	4.3	26 2.6	17 46.2	+ 9 55.5	-1.0310	0.5484	0.0560	-22	-64
κ Geminor. *mult*	3.6	0.29	4.1	24 39.6	17 57.1	+10 6.0	+0.4753	0.5482	0.0564	+74	+ 6
ω^1 Cancri	6.0	0.39	4.0	25 41.4	19 1 27.1	- 6 39.1	-1.1360	0.5453	0.0729	-32	-64
ω^2 Cancri	6.3	+0.40	+3.9	+25 23.4	1 49.8	- 6 17.4	-0.8371	0.5450	-0.0734	- 8	-65
λ Cancri	5.7	0.50	3.0	24 21.9	10 33.3	+ 2 8.7	-0.4339	0.5416	0.0917	+16	-46
υ^2 Cancri	5.8	0.54	3.1	24 30.3	14 20.1	+ 5 48.1	-0.9486	0.5408	0.0995	-15	-65
υ^3 Cancri	6.0	0.55	3.0	24 26.9	15 42.1	+ 7 7.4	-1.0240	0.5408	0.1021	-21	-66
υ^4 Cancri	5.7	0.56	3.1	24 27.3	16 24.0	+ 7 47.9	-1.1050	0.5379	0.1038	-28	-66
ξ Cancri	5.0	+0.73	+1.6	+22 29.2	20 9 51.7	+ 0 42.0	-1.0290	0.5303	-0.1360	-20	-68
79 Cancri	6.3	+0.73	+1.6	+22 26.3	10 20.7	+ 1 10.0	-1.0450	0.5303	-0.1370	-21	-68

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
B. A. C. 3138	6.3	+0.74	+1.3	+21 43.9	**20** 11 57.4	+ 2 43.7	-0.4844	0.5294	-0.1398	+15	-56
B. A. C. 3206	6.3	0.77	+0.6	20 15.5	17 28.0	+ 8 4.0	+0.3550	0.5260	0.1490	+63	-11
η Leonis	3.3	0.89	-1.3	17 17.6	**21** 15 0.4	+ 4 56.8	+0.0870	0.5158	0.1807	+46	-28
42 Leonis	6.0	0.90	2.1	15 31.5	22 32.6	-11 44.1	+0.6519	0.5130	0.1902	+88	0
i Leonis	5.7	0.93	2.5	14 41.8	**22** 3 58.9	- 6 27.2	+0.5186	0.5107	0.1967	+75	- 9
k Leonis	5.7	+0.95	-3.1	+14 46.2	11 31.3	+ 0 52.2	-1.0760	0.5078	-0.2044	-20	-75
ω Virginis	5.9	0.99	5.3	8 44.2	**23** 15 44.9	+ 4 18.3	-0.5066	0.4996	0.2278	+15	-72
ν Virginis	4.0	0.99	5.6	7 8.3	19 49.9	+ 8 16.2	+0.3309	0.4995	0.2304	+61	-23
c Virginis	5.5	0.99	6.0	+ 3 55.1	**24** 14 56.4	+ 2 51.3	-0.5875	0.4974	0.2382	+11	-79
65 Virginis	6.1	0.93	7.4	- 4 21.4	**26** 1 37.8	-11 24.2	+0.1993	0.5013	0.2390	+52	-31
66 Virginis	6.0	+0.92	-7.4	- 4 35.7	2 17.5	-10 45.6	+0.3035	0.5016	-0.2390	+58	-26
*l*² Virginis	5.1	0.92	7.4	5 41.7	6 19.9	- 6 49.9	+0.5466	0.5031	0.2380	+74	-13
80 Virginis	6.1	0.91	7.5	4 50.5	8 15.5	- 4 57.6	-0.8464	0.5040	0.2375	- 5	-90
88 Virginis	6.8	0.88	7.6	6 17.7	15 8.1	+ 1 43.4	-0.8762	0.5050	0.2345	- 7	-90
B.A.C.4647 *mult.*	6.4	0.87	7.5	7 31.4	18 41.8	+ 5 11.0	-0.3643	0.5068	0.2330	+22	-63
W. xiii, 825	6.8	+0.87	-7.3	- 9 1.6	19 6.8	+ 5 35.3	+1.1800	0.5069	-0.2328	+81	+27
94 Virginis	6.8	0.85	7.4	8 22.4	**27** 0 41.4	+11 0.3	-0.8235	0.5089	0.2296	- 5	-90
95 Virginis	6.0	0.85	7.4	8 47.7	0 54.9	+11 13.5	-0.4164	0.5091	0.2296	+18	-66
96 Virginis	6.9	0.84	7.2	9 49.2	2 6.3	-11 37.2	+0.4309	0.5098	0.2288	+64	-19
κ Virginis	4.2	0.84	7.3	9 46.1	4 8.9	- 9 38.2	-0.0925	0.5101	0.2272	+35	-47
2 Libræ	6.5	+0.81	-7.1	-11 13.1	9 37.8	- 4 18.9	+0.2519	0.5125	-0.2235	+53	-28
μ Libræ	5.7	0.76	6.7	13 41.7	22 51.8	+ 8 31.6	+0.0542	0.5198	0.2119	+39	-39
ν¹ Libræ	5.5	0.72	6.5	15 50.1	**28** 7 29.0	- 7 7.0	+0.5790	0.5253	0.2025	+69	-11
ν² Libræ	6.9	0.72	6.1	16 3.8	7 34.5	- 7 1.7	+0.8074	0.5253	0.2025	+74	+ 2
28 Libræ	6.0	0.68	5.8	17 45.9	14 26.8	- 0 22.2	+1.2775	0.5294	0.1940	+72	+41
ζ¹ Libræ	6.0	+0.66	-6.2	-16 20.3	18 2.0	+ 3 6.2	-0.9445	0.5316	-0.1892	-18	-90
ζ² Libræ	7.0	0.65	6.0	17 4.0	18 39.8	+ 3 42.8	-0.2814	0.5322	0.1886	+19	-58
ζ³ Libræ	6.0	0.65	6.2	16 14.1	19 11.9	+ 4 13.8	-1.2750	0.5326	0.1878	-47	-90
ζ⁴ Libræ	5.8	0.64	6.4	16 29.1	20 16.4	+ 5 16.2	-1.2080	0.5336	0.1864	-39	-90
41 Libræ	5.9	0.61	5.5	18 56.6	23 5.0	+ 7 59.5	+0.9158	0.5352	0.1821	+71	+10
κ Libræ	5.1	+0.60	-5.4	-19 19.6	**29** 0 31.4	+ 9 23.0	+1.0670	0.5365	-0.1803	+71	+21
λ Libræ	5.1	0.57	5.2	19 50.5	5 52.2	- 9 26.6	+0.6738	0.5396	0.1717	+70	- 5
47 Libræ	6.4	0.56	5.4	19 3.7	6 39.8	- 8 40.6	-0.2959	0.5405	0.1706	+16	-60
β¹ Scorpii	2.9	0.54	5.5	19 30.5	11 29.2	- 4 0.8	-0.6210	0.5439	0.1627	- 3	-86
β² Scorpii	5.5	0.54	5.5	19 30.3	11 29.2	- 4 0.8	-0.6246	0.5439	0.1627	- 3	-86
ω¹ Scorpii	4.6	+0.52	-5.1	-20 22.5	12 5.9	- 3 25.3	+0.2046	0.5441	-0.1615	+41	-31
ω² Scorpii	4.6	0.52	5.1	20 34.5	12 21.9	- 3 9.9	+0.3754	0.5444	0.1611	+51	-21
ω Ophiuchi	4.7	0.43	4.9	21 14.0	23 32.2	+ 7 37.6	-0.6088	0.5525	0.1405	- 4	-85
22 Ophiuchi	6.7	0.34	4.1	23 20.0	**30** 9 28.9	- 6 46.7	+0.3192	0.5600	0.1203	+43	-24
24 Ophiuchi	6.0	0.33	4.1	22 58.7	10 20.1	- 5 57.2	-0.1588	0.5608	0.1183	+17	-51
39 Ophiuchi *mult.*	5.5	+0.24	-3.7	-24 10.2	19 24.0	+ 2 47.0	+0.1193	0.5665	-0.0979	+29	-35
B. A. C. 5831	6.5	0.25	3.7	23 57.2	19 26.6	+ 2 49.5	-0.1140	0.5665	0.0977	+17	-48
θ Ophiuchi	3.3	0.23	3.4	24 53.6	21 4.4	+ 4 23.7	+0.7192	0.5665	0.0941	+65	- 1
b Ophiuchi *var.*	4.4	0.21	3.8	24 4.6	22 55.6	+ 6 10.8	-0.3275	0.5665	0.0895	+ 6	-62
*c*² Ophiuchi	5.2	0.19	3.7	23 52.8	**31** 1 2.9	+ 8 13.4	-0.7023	0.5706	0.0844	-15	-90
63 Ophiuchi	6.6	+0.09	-3.1	-24 52.0	10 45.4	- 6 25.9	-0.3668	0.5747	-0.0600	+ 1	-65
7 Sagittarii	5.9	0.05	3.2	24 16.9	14 1.4	- 3 17.4	-1.1610	0.5774	0.0515	-50	-90
9 Sagittarii	6.0	+0.04	-3.2	-24 21.9	14 26.2	- 2 53.5	-1.0910	0.5774	-0.0504	-44	-90

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
λ Sagittarii	2.9	-0.07	-2.8	-25 28.9	**1** 0 9.8	+ 6 27.7	-0.2941	0.5825	-0.0244	+ 2	-60
B. A. C. 6369	6.2	0.16	3.1	25 7.2	6 54.5	-11 3.4	-0.7689	0.5848	-0.0086	-26	-90
σ Sagittarii	2.3	0.21	2.9	26 26.0	11 1.6	- 7 5.9	+0.5876	0.5853	+0.0058	+51	- 8
ψ Sagittarii	5.4	0.31	3.1	25 26.7	19 3.6	+ 0 37.1	-0.2945	0.5878	0.0285	+ 2	-60
χ¹ Sagittarii	5.4	-0.36	-3.4	-24 43.3	22 54.6	+ 4 19.0	-0.9040	0.5883	+0.0395	-33	-90
χ³ Sagittarii	6.3	-0.36	-3.5	-24 37.6	22 57.1	+ 4 21.3	-0.9998	0.5883	+0.0395	-38	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	′	° ′	d h m	h m				°	°
h¹ Sagittarii *var.*	6.0	-0.41	-3.4	-24 57.6	2 3 8.3	+ 8 22.6	-0.4632	0.5880	+0.0512	- 6	-73
h³ Sagittarii	4.6	0.41	3.3	25 7.5	3 23.8	+ 8 37.4	-0.2828	0.5880	0.0519	+ 5	-59
17 Capricorni	6.0	0.72	4.8	21 54.7	3 6 50.3	+10 58.8	-1.0520	0.5861	0.1275	-34	-90
χ Capricorni	5.4	0.82	4.9	21 38.0	15 46.8	- 4 25.6	-0.0920	0.5829	0.1499	+23	-47
27 Capricorni	6.5	0.81	5.2	20 59.7	16 10.8	- 4 2.6	-0.6705	0.5827	0.1508	- 8	-90
ϕ Capricorni	5.5	-0.84	-5.1	-21 6.4	18 37.6	- 1 41.5	-0.1823	0.5825	+0.1567	+19	-53
33 Capricorni	5.7	0.87	5.1	21 19.9	22 3.8	+ 1 36.7	+0.5809	0.5813	0.1648	+63	-10
35 Capricorni	6.2	0.88	5.0	21 40.1	23 18.5	+ 2 48.5	+1.1400	0.5813	0.1678	+68	+29
37 Capricorni	6.0	0.92	5.4	20 34.3	4 2 24.5	+ 5 47.4	+0.5716	0.5795	0.1747	+63	-10
ε Capricorni	4.7	0.93	5.6	19 57.4	3 19.0	+ 6 39.8	+0.1167	0.5797	0.1767	+37	-35
κ Capricorni	5.0	-0.95	-5.8	-19 21.8	5 35.4	+ 8 51.0	-0.0682	0.5785	+0.1818	+28	-46
B. A. C. 7550	6.3	0.96	5.6	20 7.2	5 49.0	+ 9 4.2	+0.7271	0.5784	0.1822	+70	- 1
29 Aquarii *mult*	6.5	1.03	6.4	17 29.4	13 43.7	- 7 20.2	-0.3881	0.5747	0.1984	+13	-66
56 Aquarii	6.3	1.12	7.1	15 8.6	5 1 20.8	+ 3 51.9	-0.2876	0.5710	0.2194	+20	-59
τ¹ Aquarii *mult.*	5.8	1.17	7.3	14 37.9	8 42.3	+10 57.1	+0.8626	0.5676	0.2310	+75	+ 5
τ² Aquarii	4.1	-1.18	-7.4	-14 10.2	9 30.6	+11 43.6	+0.5922	0.5672	+0.2322	+71	-10
74 Aquarii	6.0	1.19	7.8	12 11.9	11 10.4	-10 40.2	-0.9718	0.5672	0.2346	-16	-90
ψ¹ Aquarii	4.1	1.25	8.2	9 40.9	20 46.2	- 1 25.4	-1.1450	0.5627	0.2465	-27	-90
ψ² Aquarii	4.2	1.26	8.2	9 46.8	21 39.5	- 0 33.9	-0.8289	0.5624	0.2476	- 6	-90
ψ³ Aquarii	4.8	1.26	8.1	10 12.5	22 6.7	- 0 7.8	-0.2928	0.5626	0.2480	+23	-58
B. A. C. 8274	7.0	-1.32	-8.4	- 6 59.3	6 10 59.6	-11 42.1	-0.1924	0.5593	+0.2601	+30	-52
30 Piscium	4.6	1.34	8.4	6 37.3	16 53.4	- 6 1.0	+0.9899	0.5582	0.2639	+83	+12
33 Piscium	4.7	1.35	8.4	- 6 19.1	18 23.0	- 4 34.5	+1.0870	0.5576	0.2646	+84	+19
				NEW	*MOON.*						
σ Arietis	5.5	-1.49	-4.1	+14 37.8	9 19 58.6	- 5 32.6	-0.7428	0.5586	+0.2270	+ 2	-74
13 Tauri	5.7	1.40	1.4	19 20.9	10 17 55.3	- 8 22.7	-0.9524	0.5635	0.1897	-12	-71
14 Tauri	6.3	1.40	1.3	19 19.1	18 33.0	- 7 46.6	-0.8024	0.5635	0.1884	- 3	-71
B. A. C. 1242	6.3	1.34	0.6	19 53.6	11 1 57.3	- 0 38.3	-0.0531	0.5650	0.1735	+39	-33
ω¹ Tauri	6.0	1.30	-0.4	19 19.2	5 23.4	+ 2 40.5	+1.1220	0.5655	0.1662	+90	+35
ω² Tauri	5.7	-1.28	+0.1	+20 18.6	8 49.2	+ 5 58.7	+0.6615	0.5657	+0.1586	+90	+ 6
51 Tauri	6.0	1.29	0.3	21 18.8	9 16.3	+ 6 24.9	-0.3007	0.5658	0.1576	+25	-45
53 Tauri	6.0	1.28	0.3	20 52.7	9 43.8	+ 6 51.3	+0.2186	0.5667	0.1568	+55	-18
56 Tauri	6.0	1.29	0.4	21 30.6	9 47.5	+ 6 54.8	-0.4233	0.5666	0.1568	+18	-53
κ¹ Tauri	4.7	1.27	0.8	22 2.6	12 13.2	+ 9 15.2	-0.6007	0.5657	0.1513	+ 8	-63
κ² Tauri	6.3	-1.27	+0.8	+21 57.0	12 14.5	+ 9 16.5	-0.5007	0.5657	+0.1513	+14	-57
υ¹ Tauri	4.7	1.27	0.9	22 33.9	12 36.5	+ 9 37.7	-1.0820	0.5659	0.1501	-24	-67
υ² Tauri	6.0	1.27	0.9	22 45.0	13 1.5	+10 1.3	-1.2130	0.5667	0.1496	-37	-67
B. A. C. 1373	6.0	1.25	0.7	21 22.4	13 21.2	+10 20.8	+0.2603	0.5670	0.1486	+57	-15
τ Tauri	4.5	1.21	1.5	22 44.9	19 21.0	- 7 52.7	-0.3131	0.5676	0.1348	+24	-44
99 Tauri	6.0	-1.15	+2.3	+23 46.6	12 1 53.4	- 1 34.6	-0.5547	0.5688	+0.1195	+11	-57
103 Tauri	6.0	1.10	2.7	24 7.2	6 13.1	+ 2 35.3	-0.4181	0.5688	0.1089	+18	-48
118 Tauri	5.7	1.00	3.7	25 3.7	15 6.0	+11 8.7	-0.5387	0.5688	0.0869	+11	-53
121 Tauri	6.0	0.96	3.8	23 57.9	17 43.4	-10 19.8	+0.8331	0.5688	0.0803	+90	+23
125 Tauri	6.0	0.93	4.2	25 50.2	19 29.0	- 8 38.0	-1.0020	0.5676	0.0760	-19	-64
132 Tauri	5.3	-0.88	+4.1	+24 31.8	23 25.3	- 4 50.4	+0.6567	0.5668	+0.0657	+90	+14
139 Tauri	5.3	0.84	4.7	25 56.4	13 3 10.8	- 1 13.2	-0.6059	0.5668	0.0561	+ 7	-56
5 Geminorum	6.7	0.75	4.5	24 26.8	8 56.4	+ 4 19.6	+1.2630	0.5663	0.0416	+90	+62
ε Geminorum	3.2	0.56	5.1	25 14.4	23 43.3	- 6 23.6	+0.7568	0.5633	+0.0066	+90	+25
37 Geminorum	6.3	0.49	5.3	25 30.8	14 3 36.7	- 1 40.8	+0.4659	0.5610	-0.0056	+73	+10
39 Geminorum	6.3	-0.48	+5.5	+26 13.5	5 6.4	- 0 14.4	-0.3100	0.5600	-0.0091	+24	-32
40 Geminorum	6.3	0.47	5.5	26 3.9	5 23.3	+ 0 2.0	-0.1397	0.5598	0.0100	+34	-23
52 Geminorum	6.3	0.37	5.3	25 4.5	12 1.8	+ 6 26.1	+0.8089	0.5582	0.0261	+90	+27
A Geminorum	5.7	0.31	5.4	25 15.6	15 52.5	+10 8.6	+0.4909	0.5567	0.0353	+75	+ 9
c Geminorum	6.0	0.17	5.9	26 2.7	15 0 59.2	- 5 3.9	-0.7825	0.5517	0.0568	- 4	-64
κ Geminor. *mult.*	3.6	-0.16	+5.3	+24 39.7	1 9.8	- 4 53.6	+0.7119	0.5517	-0.0571	+90	+18
ω¹ Cancri	6.0	-0.07	+5.7	+25 41.5	8 32.7	+ 2 14.1	-0.8927	0.5479	-0.0753	-11	-64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ω^2 Cancri	6.3	-0.05	+5.7	+25 23.5	15 8 54.9	+ 2 35.4	-0.5928	0.5476	-0.0746	+ 8	-57
λ Cancri	5.7	+0.06	5.2	24 22.0	17 31.5	+10 54.5	-0.1971	0.5433	0.0929	+31	-34
υ^1 Cancri *mult.*	6.0	0.10	5.4	24 53.6	20 20.8	-10 21.8	-1.0440	0.5414	0.0986	-22	-65
υ^2 Cancri	5.8	0.12	5.3	24 30.4	21 15.5	- 9 29.0	-0.7117	0.5408	0.1004	+ 1	-65
υ^3 Cancri	6.0	0.13	5.2	24 27.0	22 36.5	- 8 10.6	-0.7861	0.5404	0.1033	- 3	-66
υ^4 Cancri	5.7	+0.14	+5.3	+24 27.4	23 18.2	- 7 30.3	-0.8666	0.5400	-0.1046	- 9	-66
ξ Caneri	5.0	0.35	4.2	22 29.3	16 16 36.8	+ 9 14.7	-0.8070	0.5305	0.1373	- 4	-68
79 Cancri	6.3	0.35	4.1	22 26.4	17 5.6	+ 9 42.5	-0.8181	0.5303	0.1385	- 5	-68
B. A. C. 3138	6.3	0.37	3.8	21 44.0	18 41.8	+11 15.7	-0.2629	0.5290	0.1408	+27	-43
B. A. C. 3206	6.3	0.42	3.7	20 15.6	17 0 10.6	- 7 25.8	+0.5672	0.5261	0.1500	+81	0
η Leonis	3.3	+0.63	+1.2	+17 17.7	21 39.0	-10 36.7	+0.2772	0.5152	-0.1820	+56	-15
42 Leonis	6.0	0.69	+0.3	15 31.6	18 5 11.6	- 3 17.5	+0.8320	0.5115	0.1912	+90	+10
i Leonis	5.7	0.72	-0.2	14 41.9	10 37.9	+ 1 59.3	+0.6932	0.5091	0.1974	+90	+ 1
k Leonis	5.7	0.79	0.6	14 46.2	18 10.7	+ 9 19.2	-0.9076	0.5059	0.2056	- 8	-75
ω Virginis	5.9	0.94	3.6	8 44.3	19 22 27.1	-11 12.0	-0.3893	0.4984	0.2289	+22	-62
ν Virginis	4.0	+0.95	-4.2	+ 7 8.4	20 2 32.3	- 7 13.9	+0.4410	0.4981	-0.2314	+68	-17
c Virginis	5.5	1.04	5.6	+ 3 55.1	21 39.4	+11 21.8	-0.5111	0.4967	0.2397	+15	-73
48 Virginis	6.7	1.10	7.6	- 3 4.7	21 21 40.1	+10 43.3	+1.3730	0.4995	0.2430	+87	+48
65 Virginis	6.1	1.13	7.9	4 21.4	22 8 15.0	- 2 59.5	+0.2062	0.5027	0.2424	+53	-31
66 Virginis	6.0	1.13	8.0	4 35.7	8 54.5	- 2 21.1	+0.3078	0.5027	0.2412	+58	-26
l^2 Virginis	5.1	+1.14	-8.2	- 5 41.7	12 55.7	+ 1 33.1	+0.5429	0.5045	-0.2405	+74	-13
80 Virginis	6.1	1.14	8.1	4 50.5	14 50.2	+ 3 24.6	-0.8492	0.5045	0.2397	- 4	-90
95 Virginis	6.0	1.17	8.5	8 47.7	23 7 22.1	- 4 31.8	-0.4492	0.5118	0.2325	+16	-69
κ Virginis	4.2	1.18	8.5	9 46.1	10 34.8	- 1 25.2	-0.1338	0.5130	0.2302	+32	-49
μ Libræ	5.7	1.20	8.5	13 41.7	24 5 5.9	- 7 26.8	-0.0181	0.5235	0.2151	+36	-43
ν^1 Libræ	5.5	+1.20	-8.3	-15 50.1	13 37.7	+ 0 48.7	+0.4910	0.5290	-0.2056	+64	-14
41 Libræ	5.9	1.18	7.6	18 56.6	25 5 2.5	- 8 15.9	+0.8039	0.5388	0.1851	+71	+ 3
κ Libræ	5.1	1.18	7.5	19 19.6	6 27.8	- 6 53.2	+0.9502	0.5398	0.1827	+71	+12
λ Libræ	5.1	1.18	7.2	19 50.5	11 44.9	- 1 46.8	+0.5559	0.5437	0.1744	+63	-12
47 Libræ	6.4	1.17	7.2	19 3.7	12 31.8	- 1 1.2	-0.4138	0.5443	0.1730	+10	-68
β^1 Scorpii	2.9	+1.16	-7.2	-19 30.5	17 18.1	+ 3 35.1	-0.7411	0.5474	-0.1647	- 9	-90
β^2 Scorpii	5.5	1.16	7.2	19 30.3	17 18.2	+ 3 35.2	-0.7447	0.5474	0.1649	- 9	-90
ω^1 Scorpii	4.6	1.17	6.9	20 22.5	17 54.4	+ 4 10.2	+0.0816	0.5482	0.1641	+34	-37
ω^2 Scorpii	4.6	1.17	6.8	20 34.5	18 10.4	+ 4 25.7	+0.2500	0.5483	0.1635	+44	-28
ω Ophiuchi	4.7	1.13	6.3	21 14.0	26 5 13.4	- 8 54.2	-0.7420	0.5564	0.1426	-11	-90
22 Ophiuchi	6.7	+1.09	-5.4	-23 20.0	15 4.6	+ 0 36.1	+0.1761	0.5635	-0.1220	+35	-32
24 Ophiuchi	6.0	1.08	5.4	22 58.7	15 55.3	+ 1 25.0	-0.3023	0.5635	0.1198	+10	-60
39 Ophiuchi *mult.*	5.5	1.04	4.7	24 10.2	27 0 54.9	+10 5.2	-0.0333	0.5693	0.0995	+22	-44
B. A. C. 5831	6.5	1.04	4.7	23 57.2	0 57.5	+10 7.7	-0.2667	0.5695	0.0995	+10	-58
θ Ophiuchi	3.3	1.02	4.4	24 53.6	2 34.9	+11 41.6	+0.5639	0.5698	0.0953	+56	-10
b Ophiuchi *var.*	4.4	+1.01	-4.5	-24 4.6	4 25.4	-10 32.0	-0.4641	0.5714	-0.0907	- 2	-73
c^2 Ophiuchi	5.2	1.00	4.3	23 52.8	6 32.0	- 8 30.2	-0.8564	0.5715	0.0854	-24	-90
63 Ophiuchi	6.6	0.94	3.4	24 52.0	16 12.4	+ 0 48.4	-0.5314	0.5764	0.0609	- 8	-79
λ Sagittarii	2.9	0.82	2.5	25 28.9	28 5 36.4	-10 18.4	-0.4609	0.5814	0.0247	- 8	-73
B. A. C. 6369	6.2	0.74	2.3	25 7.2	12 22.2	- 3 48.4	-0.9412	0.5837	0.0062	-36	-90
ϕ Sagittarii	3.7	+0.75	-1.7	-27 6.2	12 39.7	- 3 31.5	+1.1160	0.5840	-0.0054	+63	+30
σ Sagittarii	2.3	0.70	1.8	26 26.0	16 30.7	+ 0 10.4	+0.4197	0.5844	+0.0055	+39	-18
ψ Sagittarii	5.4	0.61	1.7	25 26.7	29 0 36.2	+ 7 56.9	-0.4664	0.5848	0.0282	- 8	-73
χ^1 Sagittarii	5.4	0.56	1.6	24 43.3	4 29.5	+11 41.1	-1.0800	0.5848	0.0392	-44	-90
χ^2 Sagittarii	6.3	0.56	1.7	24 37.6	4 32.0	+11 43.4	-1.1770	0.5848	0.0392	-52	-90
h^1 Sagittarii *var.*	6.0	+0.52	-1.3	-24 57.6	8 45.7	- 8 12.8	-0.6426	0.5854	+0.0512	-15	-90
h^2 Sagittarii	4.6	0.51	1.2	25 7.5	9 1.6	- 7 57.6	-0.4588	0.5854	0.0519	- 6	-73
17 Capricorni	6.0	0.14	1.0	21 54.7	30 12 56.3	- 5 8.1	-1.2360	0.5793	0.1264	-52	-90
χ Capricorni	5.4	0.02	0.6	21 38.0	22 5.4	+ 3 40.1	-0.2576	0.5757	0.1484	+15	-57
27 Capricorni	6.5	+0.01	-0.9	-20 59.7	22 30.0	+ 4 3.8	-0.8459	0.5757	+0.1494	-17	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
φ Capricorni	5.5	-0.02	-0.7	-21 6.4	1 1 0.5	+ 6 28.7	-0.3385	0.5744	+0.1567	+11	-63
33 Capricorni	5.7	0.06	0.5	21 19.0	4 32.2	+ 9 52.3	+0.4231	0.5731	0.1631	+53	-19
35 Capricorni	6.2	0.08	0.3	21 40.1	5 48.9	+11 6.1	+0.9915	0.5727	0.1660	+68	+16
37 Capricorni	6.0	0.13	0.7	20 34.3	9 0.0	- 9 49.9	+0.4172	0.5706	0.1726	+53	-19
ε Capricorni	4.7	0.13	0.9	19 57.4	9 56.2	- 8 55.8	-0.0439	0.5706	0.1747	+28	-44
κ Capricorni	5.0	-0.16	-1.1	-19 21.8	12 16.5	- 6 40.7	-0.2297	0.5702	+0.1797	+20	-55
B. A. C. 7550	6.3	0.16	0.8	20 7.2	12 30.5	- 6 27.2	+0.5793	0.5702	0.1803	+64	-10
29 Aquarii *mult.*	6.5	0.26	1.5	17 29.4	20 39.5	+ 1 23.7	-0.5479	0.5646	0.1956	+ 5	-78
56 Aquarii	6.3	0.41	2.1	15 8.6	2 8 38.9	-11 2.8	-0.4379	0.5606	0.2166	+13	-69
τ¹ Aquarii *mult.*	5.8	0.53	2.0	14 37.9	16 15.1	- 3 42.9	+0.7387	0.5572	0.2278	+74	- 2
τ² Aquarii	4.1	-0.54	-2.1	-14 10.2	17 5.0	- 2 54.7	+0.4639	0.5569	+0.2292	+64	-17
74 Aquarii	6.0	0.55	2.8	12 11.9	18 48.1	- 1 15.2	-1.1220	0.5567	0.2315	-27	-90
ψ¹ Aquarii	4.1	0.65	3.3	9 40.9	3 4 43.2	+ 8 19.2	-1.2890	0.5533	0.2437	-40	-90
ψ² Aquarii	4.2	0.66	3.3	9 46.8	5 38.3	+ 9 12.5	-0.9631	0.5529	0.2447	-13	-90
ψ³ Aquarii	4.8	0.66	3.1	10 12.5	6 6.3	+ 9 39.4	-0.4190	0.5516	0.2447	+17	-67
B. A. C. 8274	7.0	-0.78	-3.8	- 6 59.3	19 25.3	- 1 29.0	-0.3000	0.5487	+0.2565	+25	-59
30 Piscium	4.6	0.83	3.7	6 37.3	4 1 30.8	+ 4 24.0	+0.9099	0.5479	0.2607	+83	+ 7
33 Piscium	4.7	0.85	3.7	6 19.1	3 3.0	+ 5 53.1	+1.0080	0.5478	0.2615	+84	+13
14 Ceti	6.0	0.98	4.7	1 6.4	16 49.5	- 4 48.3	-0.5616	0.5464	0.2664	+12	-77
15 Ceti	6.8	0.99	4.6	- 1 6.4	17 59.3	- 3 40.8	-0.2517	0.5464	0.2665	+28	-56
26 Ceti	5.9	-1.07	-4.6	+ 0 46.9	5 5 45.4	+ 7 41.7	+0.9984	0.5460	+0.2662	+90	+13
29 Ceti	6.3	1.09	4.6	1 25.3	7 39.7	+ 9 32.1	+0.8650	0.5460	0.2659	+90	+ 5
33 Ceti	6.1	1.10	4.7	1 51.9	8 50.4	+10 40.5	+0.7350	0.5462	0.2656	+90	- 4
f Piscium	5.1	1.12	4.1	3 2.3	12 8.6	-10 8.1	+0.4367	0.5463	0.2645	+68	-19
μ Piscium	5.0	1.17	-5.0	5 34.7	17 45.0	- 4 43.0	-0.6277	0.5480	0.2625	+ 9	-81
				NEW	*MOON.*						
κ¹ Tauri	4.7	-1.36	0.0	+22 2.6	8 22 13.6	- 2 56.3	-0.5232	0.5703	+0.1539	+13	-58
υ¹ Tauri	4.7	1.37	+0.1	22 33.9	22 36.4	- 2 34.3	-1.0035	0.5703	0.1523	-17	-67
τ Tauri	4.5	1.34	0.8	22 44.9	9 5 16.0	+ 3 50.5	-0.2310	0.5725	0.1371	+29	-39
Mars				+23 12.9	10 36.0	+ 8 58.1	-0.0190	0.5449	+0.1208	+41	-27
99 Tauri	6.0	-1.29	+1.5	23 46.6	11 43.1	+10 3.2	-0.4620	0.5737	0.1214	+15	-52
103 Tauri	6.0	1.28	1.9	24 7.2	15 59.0	- 9 50.6	-0.3258	0.5737	0.1108	+24	-42
118 Tauri	5.7	1.22	2.9	25 3.7	10 0 43.0	- 1 26.2	-0.4372	0.5741	0.0885	+17	-47
121 Tauri	6.0	1.18	3.0	23 57.9	3 17.5	+ 1 2.5	+0.9303	0.5744	0.0820	+90	+29
125 Tauri	6.0	-1.18	+3.4	+25 50.2	5 1.3	+ 2 42.4	-0.8935	0.5738	+0.0774	-11	-64
132 Tauri	5.3	1.14	3.5	24 31.8	8 53.2	+ 6 25.6	+0.7565	0.5738	0.0675	+90	+20
139 Tauri	5.3	1.11	4.0	25 56.4	12 34.3	+ 9 58.3	-0.4965	0.5738	0.0578	+14	-48
ε Geminorum	3.2	0.87	4.9	25 14.4	11 7 43.0	+ 4 24.1	+0.8672	0.5698	+0.0071	+90	+32
37 Geminorum	6.3	0.83	5.2	25 30.8	12 30.5	+ 9 1.0	+0.5826	0.5672	-0.0053	+84	+16
39 Geminorum	6.3	-0.82	+5.4	+26 13.5	13 58.2	+10 25.5	-0.1868	0.5671	-0.0089	+31	-25
40 Geminorum	6.3	0.81	5.4	26 3.9	14 15.0	+10 41.6	-0.0179	0.5670	0.0098	+41	-16
47 Geminorum	6.0	0.75	5.8	27 2.2	19 17.8	- 8 26.7	-1.1410	0.5654	0.0225	-33	-63
52 Geminorum	6.3	0.73	5.4	25 4.5	20 45.0	- 7 2.6	+0.9268	0.5644	0.0262	+90	+34
A Geminorum	5.7	0.68	5.6	25 15.6	12 0 31.0	- 3 24.8	+0.6120	0.5626	0.0354	+88	+15
κ Geminor. *mult.*	3.6	-0.56	+5.7	+24 39.7	9 37.3	+ 5 21.9	+0.8362	0.5581	-0.0574	+90	+25
ω¹ Cancri	6.0	0.47	6.2	25 41.5	16 52.0	-11 38.7	-0.7563	0.5536	0.0744	- 2	-64
ω² Cancri	6.3	0.47	6.1	25 23.5	17 13.6	-11 17.9	-0.4584	0.5535	0.0752	+16	-47
λ Cancri	5.7	0.35	6.0	24 22.0	13 1 41.2	- 3 8.0	-0.0634	0.5482	0.0938	+38	-26
υ¹ Cancri *mult.*	6.0	0.32	6.2	24 53.6	4 27.7	- 0 27.1	-0.9057	0.5468	0.0998	-11	-65
υ² Cancri	5.8	-0.30	+6.0	+24 30.4	5 21.4	+ 0 24.7	-0.5753	0.5462	-0.1015	+10	-57
υ³ Cancri	6.0	0.29	6.1	24 27.0	6 41.2	+ 1 41.8	-0.6496	0.5446	0.1042	+ 5	-62
υ⁴ Cancri	5.7	0.28	6.1	24 27.4	7 22.2	+ 2 21.5	-0.7278	0.5440	0.1056	0	-66
ξ Cancri	5.0	0.05	5.4	22 20.3	14 0 26.2	- 5 8.2	-0.6691	0.5334	0.1382	+ 5	-66
79 Cancri	6.3	0.04	5.3	22 26.4	0 54.7	- 4 40.7	-0.6820	0.5334	0.1390	+ 4	-67
B. A. C. 3138	6.3	-0.03	+5.0	+21 44.0	2 29.7	- 3 8.7	-0.1298	0.5334	-0.1417	+35	-35
B. A. C. 3206	6.3	+0.03	+4.4	+20 15.6	7 54.7	+ 2 6.0	+0.6979	0.5284	-0.1509	+90	+ 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
η Leonis	3.3	+0.28	+2.8	+17 17.7	**15** 5 12.5	− 1 15.5	+0.4045	0.5148	−0.1822	+65	− 9
42 Leonis	6.0	0.35	1.9	15 31.6	12 42.8	+ 6 1.5	+0.9559	0.5115	0.1917	+90	+17
i Leonis	5.7	0.40	1.5	14 41.9	18 8.0	+11 17.1	+0.8141	0.5084	0.1978	+90	+ 8
k Leonis	5.7	0.47	+1.3	14 46.2	**16** 1 39.7	− 5 24.1	−0.7861	0.5056	0.2061	− 1	−75
ι Leonis *mult.*	4.1	0.65	−0.7	11 7.8	21 56.5	− 9 41.8	−1.1160	0.4978	0.2232	−22	−79
ω Virginis	5.9	+0.72	−1.9	+ 8 44.3	**17** 5 57.3	− 1 54.3	−0.2837	0.4961	−0.2287	+27	−56
ν Virginis	4.0	0.75	2.6	7 8.4	10 2.8	+ 2 4.3	+0 5434	0.4956	0.2311	+76	−12
c Virginis	5.5	0.90	4.2	+ 3 55.1	**18** 5 13.4	− 3 16.5	−0.4229	0.4950	0.2398	+20	−66
65 Virginis	6.1	1.13	7.3	− 4 21.4	**19** 15 54.5	+ 6 27.2	+0.2641	0.5016	0.2422	+57	−28
66 Virginis	6.0	1.13	7.4	4 35.7	16 33.9	+ 7 5.6	+0.3636	0.5016	0.2415	+62	−23
l^2 Virginis	5.1	+1.16	−7.7	− 5 41.7	20 34.9	+11 0.0	+0.5946	0.5037	−0.2409	+78	−11
80 Virginis	6.1	1.20	7.4	4 50.5	22 30.4	−11 8.0	−0.7968	0.5037	0.2402	− 2	−90
95 Virginis	6.0	1.27	8.4	8 47.7	**20** 15 0.3	+ 4 53.6	−0.4115	0.5115	0.2332	+18	−66
κ Virginis	4.2	1.31	8.5	9 46.1	18 12.0	+ 7 59.1	−0.0991	0.5129	0.2311	+34	−47
μ Libræ	5.7	1.42	8.9	13 41.8	**21** 12 37.3	+ 1 51.8	0.0000	0.5248	0.2163	+37	−42
ν^1 Libræ	5.5	+1.47	−8.9	−15 50.1	21 4.3	+10 2.9	+0.4974	0.5310	−0.2074	+63	−15
41 Libræ	5.9	1.55	8.5	18 56.6	**22** 12 19.3	+ 0 48.2	+0.7992	0.5437	0.1876	+71	+ 2
κ Libræ	5.1	1.55	8.5	19 19.6	13 43.7	+ 2 9.8	+0.9417	0.5438	0.1848	+71	+11
λ Libræ	5.1	1.57	8.2	19 50.5	18 56.4	+ 7 12.2	+0.5459	0.5480	0.1765	+62	−12
β^1 Scorpii	2.9	1.59	7.8	19 30.5	**23** 0 24.9	−11 30.6	−0.7464	0.5520	0.1669	− 9	−90
β^2 Scorpii	5.5	+1.59	−7.8	−19 30.3	0 24.9	−11 30.6	−0.7501	0.5520	−0.1669	− 9	−90
ω^1 Scorpii	4.6	1.60	7.8	20 22.5	1 0.7	−10 56.0	+0.0704	0.5522	0.1659	+33	−38
ω^2 Scorpii	4.6	1.60	7.8	20 34.5	1 16.4	−10 40.4	+0.2358	0.5525	0.1655	+43	−29
ω Ophiuchi	4.6	1.62	7.1	21 14.0	12 9.1	− 0 11.0	−0.7561	0.5616	0.1445	−12	−90
24 Ophiuchi	6.0	1.65	6.1	22 58.7	22 40.2	+ 9 57.3	−0.3227	0.5686	0.1216	+ 9	−62
39 Ophiuchi *mult.*	5.5	+1.66	−5.3	−24 10.2	**24** 7 30.5	− 5 32.1	−0.0608	0.5749	−0.1007	+20	−46
B. A. C. 5831	6.5	1.66	5.3	23 57.2	7 32.9	− 5 29.7	−0.2904	0.5749	0.1007	+ 9	−60
θ Ophiuchi	3.3	1.67	5.1	24 53.6	9 8.5	− 3 57.8	+0.5321	0.5758	0.0969	+53	−12
b Ophiuchi *var.*	4.4	1.65	5.0	24 4.6	10 56.9	− 2 13.3	−0.4896	0.5768	0.0922	− 3	−75
c^2 Ophiuchi	5.2	1.65	4.7	23 52.8	13 1.4	− 0 13.8	−0.8802	0.5782	0.0870	−25	−90
63 Ophiuchi	6.6	+1.64	−3.6	−24 52.0	22 31.2	+ 8 54.2	−0.5589	0.5830	−0.0619	−10	−82
λ Sagittarii	2.9	1.59	2.1	25 28.8	**25** 11 40.7	− 2 27.1	−0.4990	0.5874	0.0254	−10	−76
B. A. C. 6369	6.2	1.54	1.6	25 7.1	18 19.7	+ 3 56.1	−0.9777	0.5891	0.0064	−39	−90
φ Sagittarii	3.7	1.56	1.2	27 6.1	18 36.6	+ 4 12.3	+1.0650	0.5894	−0.0057	+63	+26
σ Sagittarii	2.3	1.53	1.0	26 25.9	22 23.9	+ 7 50.6	+0.3746	0.5902	+0.0052	+36	−20
ψ Sagittarii	5.4	+1.46	−0.4	−25 26.6	**26** 6 21.9	− 8 30.4	−0.5103	0.5902	+0.0283	−10	−77
h^1 Sagittarii *var.*	6.0	1.39	+0.4	24 57.5	14 24.8	− 0 46.8	−0.6871	0.5899	0.0517	−17	−90
h^2 Sagittarii	4.6	1.38	0.4	25 7.4	14 40.5	− 0 31.8	−0.5042	0.5899	0.0521	− 8	−76
χ Capricorni	5.4	0.92	3.0	21 37.9	**28** 3 27.5	+10 49.3	−0.3102	0.5762	0.1485	+12	−61
27 Capricorni	6.5	0.92	2.8	20 59.6	3 51.8	+11 12.9	−0.8982	0.5762	0.1495	−21	−90
φ Capricorni	5.5	+0.89	+3.0	−21 6.3	6 22.2	−10 22.4	−0.4017	0.5750	+0.1552	+ 8	−67
33 Capricorni	5.7	0.84	3.3	21 18.9	9 54.0	− 6 58.6	+0.3730	0.5723	0.1631	+50	−21
35 Capricorni	6.2	0.83	3.5	21 40.0	11 10.9	− 5 44.6	+0.9423	0.5725	0.1660	+68	+12
37 Capricorni	6.0	0.78	3.4	20 34.2	14 22.3	− 2 40.2	+0.3672	0.5701	0.1732	+51	−22
ε Capricorni	4.7	0.76	3.2	19 57.3	15 18.7	− 1 46.0	−0.0948	0.5698	0.1745	+25	−47
κ Capricorni	5.0	+0.73	+3.1	−19 21.7	17 39.4	+ 0 29.5	−0.2826	0.5688	+0.1794	+16	−59
B. A. C. 7550	6.3	0.73	3.4	20 7.1	17 53.5	+ 0 43.1	+0.5279	0.5685	0.1797	+61	−13
29 Aquarii *mult.*	6.5	0.62	3.0	17 29.3	**29** 2 5.3	+ 8 36.9	−0.6013	0.5633	0.1951	+ 2	−83
56 Aquarii	6.3	0.45	2.8	15 8.5	14 11.6	− 3 42.6	−0.4898	0.5585	0.2156	+10	−73
τ^1 Aquarii *mult.*	5.8	0.35	3.1	14 37.8	21 54.0	+ 3 43.4	+0.6947	0.5529	0.2263	+76	− 5
τ^2 Aquarii	4.1	+0.33	+2.6	−14 10.1	22 44.5	+ 4 32.2	+0.4200	0.5526	+0.2274	+60	−20
74 Aquarii	6.0	0.30	2.3	12 11.8	**30** 0 29.2	+ 6 13.3	−1.1770	0.5517	0.2296	−31	−90
ψ^3 Aquarii	4.2	0.16	1.9	9 46.7	11 30.9	− 7 7.7	−1.0190	0.5470	0.2424	−17	−90
ψ^1 Aquarii	4.8	+0.15	2.1	10 12.4	11 59.6	− 6 40.1	−0.4688	0.5468	0.2429	+15	−71
B. A. C. 8274	7.0	−0.03	1.4	6 59.2	**31** 1 35.6	+ 6 28.6	−0.3423	0.5426	0.2540	+23	−62
30 Piscium	4.6	−0.09	+1.4	− 6 37.2	7 49.5	−11 30.0	+0.8786	0.5412	+0.2577	+83	+ 5
33 Piscium	4.7	−0.11	+1.4	− 6 19.0	9 24.2	− 9 58.5	+0.9797	0.5409	+0.2584	+84	+11

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
					MAY.						
B. A. C. 17	6.0	-0.14	+1.3	- 5 51.2	31 11 43.4	- 7 43.8	+1.1130	0.5403	+0.2595	+84	+21
14 Ceti	6.0	-0.28	+0.1	- 1 6.3	23 32.2	+ 3 41.9	-0.6036	0.5384	+0.2627	+10	-81
					JUNE.						
15 Ceti	6.8	-0.29	+0.1	- 1 6.3	1 0 44.0	+ 4 51.4	-0.2901	0.5383	+0.2629	+27	-58
26 Ceti	5.9	0.42	0.0	+ 0 47.0	12 49.5	- 7 26.8	+0.9797	0.5375	0.2624	+90	+11
29 Ceti	6.3	0.44	-0.1	1 25.4	14 47.0	- 5 33.4	+0.8449	0.5375	0.2619	+90	+ 4
33 Ceti	6.1	0.45	0.2	1 52.0	15 59.7	- 4 22.9	+0.7145	0.5384	0.2619	+90	- 5
35 Ceti	6.3	0.46	0.2	1 53.7	16 55.3	- 3 29.1	+0.9307	0.5387	0.2618	+90	+ 9
f Piscium	5.1	-0.49	-0.4	+ 3 2.4	19 23.4	- 1 5.9	+0.4138	0.5389	+0.2611	+66	-20
μ Piscium	5.0	0.55	1.0	5 34.8	2 1 9.3	+ 4 28.8	-0.6620	0.5394	0.2586	+ 7	-83
ξ Arietis	5.3	0.76	0.9	10 7.0	2 25.0	+ 4 53.9	+1.0590	0.5459	0.2399	+90	+20
31 Arietis	5.7	0.82	1.1	11 58.5	7 45.3	+10 3.6	+0.4336	0.5483	0.2342	+68	-16
σ Arietis	5.5	0.88	-1.3	14 37.9	14 26.4	- 7 29.0	-0.7410	0.5512	0.2257	+ 2	-74
Venus				+14 54.3	3 18 6.2	- 3 57.0	-0.2065	0.5043	+0.2051	+31	-48
				NEW	*MOON.*						
ε Geminorum	3.2	-0.94	+4.5	25 14.3	7 16 45.5	- 8 45.4	+0.8582	0.5732	+0.0071	+90	+32
37 Geminorum	6.3	0.91	4.7	25 30.7	21 30.7	- 4 10.8	+0.5826	0.5716	-0.0053	+84	+16
39 Geminorum	6.3	-0.91	+4.9	+26 13.4	22 58.0	- 2 47.0	-0.1865	0.5708	-0.0091	+31	-25
40 Geminorum	6.3	0.90	4.9	26 3.8	23 14.6	- 2 30.9	-0.0178	0.5706	0.0099	+41	-16
47 Geminorum	6.0	0.87	5.3	27 2.2	8 4 15.0	+ 2 18.3	-1.1410	0.5694	0.0228	-33	-63
52 Geminorum	6.3	0.85	5.1	25 4.5	5 41.3	+ 3 41.6	+0.9215	0.5685	0.0264	+90	+34
A Geminorum	5.7	0.82	5.3	25 15.6	9 25.1	+ 7 17.3	+0.6089	0.5666	0.0359	+87	+15
c Geminorum	6.0	-0.74	+5.8	+26 2.7	18 15.7	- 8 11.4	-0.6488	0.5622	-0.0577	+ 5	-59
κ Geminor *mult.*	3.6	0.73	5.5	24 39.7	18 26.0	- 8 1.4	+0.8297	0.5618	0.0578	+90	+25
ω^1 Cancri	6.0	0.67	6.0	25 41.5	9 1 36.0	- 1 6.7	-0.7570	0.5577	0.0749	- 2	-64
ω^2 Cancri	6.3	0.66	6.0	25 23.5	1 57.5	- 0 46.1	-0.4604	0.5573	0.0758	+16	-48
λ Cancri	5.7	0.57	6.0	24 22.0	10 19.3	+ 7 18.2	-0.0668	0.5525	0.0948	+38	-27
υ^1 Cancri *mult.*	6.0	-0.54	+6.2	+24 53.6	13 4.0	+ 9 57.1	-0.9078	0.5511	-0.1006	-12	-65
υ^2 Cancri	5.8	0.53	6.1	24 30.4	13 57.1	+10 48.5	-0.5768	0.5502	0.1026	+ 9	-57
υ^3 Cancri	6.0	0.52	6.1	24 27.0	15 16.0	-11 55.3	-0.6528	0.5493	0.1051	+ 5	-62
υ^4 Cancri	5.7	0.51	6.2	24 27.4	15 56.4	-11 16.3	-0.7304	0.5484	0.1065	0	-66
ξ Cancri	5.0	0.31	5.8	22 29.3	10 8 49.4	+ 5 2.8	-0.6740	0.5374	0.1393	+ 4	-66
79 Cancri	6.3	-0.31	+5.7	+22 26.4	9 17.6	+ 5 30.1	-0.6868	0.5374	-0.1403	+ 4	-67
B. A. C. 3138	6.3	0.29	5.5	21 44.0	10 51.5	+ 7 0.9	-0.1367	0.5357	0.1428	+34	-35
B. A. C. 3206	6.3	-0.23	5.1	20 15.6	16 13.5	-11 47.4	+0.6844	0.5319	0.1521	+90	+ 7
η Leonis	3.3	+0.01	3.9	17 17.7	11 13 20.5	+ 8 40.3	+0.3890	0.5177	0.1834	+66	-13
42 Leonis	6.0	0.08	3.5	15 31.6	20 47.9	- 8 5.7	+0.9376	0.5133	0.1928	+90	+16
i Leonis	5.7	+0.13	+2.8	+14 41.9	12 2 11.4	- 2 51.7	+0.7960	0.5101	-0.1986	+90	+ 7
k Leonis	5.7	0.20	2.5	14 46.3	9 41.4	+ 4 25.3	-0.8048	0.5063	0.2065	- 2	-75
ι Leonis *mult*	4.1	0.39	+0.8	11 7.8	13 5 56.4	+ 0 6.0	-1.1420	0.4981	0.2236	-24	-79
ω Virginis	5.9	0.46	-0.2	8 44.3	13 57.8	+ 7 54.2	-0.3063	0.4961	0.2287	+26	-57
ξ Virginis	5.3	0.50	0.3	8 51.8	17 44.2	+11 34.3	-1.3110	0.4941	0.2304	-40	-81
ν Virginis	4.0	+0.49	-0.9	+ 7 8.4	18 3.9	+11 53.4	+0.5176	0.4943	-0.2306	+74	-13
c Virginis	5.5	0.66	2.5	3 55.2	14 13 19.4	+ 6 37.6	-0.4504	0.4922	0.2383	+18	-68
B. A. C. 4254	6.1	0.75	3.3	+ 2 27.3	23 23.5	- 7 34.7	-1.2460	0.4928	0.2406	-32	-88
48 Virginis	6.7	0.87	5.5	- 3 4.6	15 13 34.5	+ 6 13.2	+1.4120	0.4948	0.2414	+87	+59
65 Virginis	6.1	0.97	6.0	4 21.4	16 0 15.2	- 7 23.8	+0.2354	0.4984	0.2405	+55	-30
66 Virginis	6.0	+0.98	-6.1	- 4 35.7	0 55.1	- 6 45.0	+0.3394	0.4989	-0.2405	+61	-24
l^1 Virginis	5.1	1.02	6.5	5 41.7	4 58.2	- 2 48.8	+0.5692	0.4997	0.2391	+76	-12
80 Virginis	6.1	1.04	6.2	4 50.5	6 53.9	- 0 56.4	-0.8235	0.5007	0.2388	- 3	-90
88 Virginis	6.8	1.10	6.7	6 17.7	13 46.7	+ 5 44.7	-0.8712	0.5039	0.2365	- 7	-90
B. A. C. 4647 *mult.*	6.4	1.13	7.1	7 31.4	17 19.9	+ 9 12.0	-0.3732	0.5054	0.2348	+21	-64
W. xiii, 825	6.8	+1.14	-7.5	- 9 1.6	17 44.8	+ 9 36.1	+1.1650	0.5057	-0.2348	+81	+25
94 Virginis	6.8	+1.19	-7.3	- 8 22.4	23 18.2	- 9 0.2	-0.8408	0.5087	-0.2320	- 5	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
95 Virginis	6.0	+1.20	-7.4	- 8 47.7	**16** 23 31.6	- 8 47.1	-0.4358	0.5092	-0.2318	+17	-68
96 Virginis	6.9	1.21	7.7	9 49.2	**17** 0 42.8	- 7 38.1	+0.4025	0.5092	0.2310	+63	-21
κ Virginis	4.2	1.25	7.7	9 46.1	2 44.5	- 5 40.0	-0.1227	0.5107	0.2300	+33	-49
2 Libræ	6.5	1.28	8.0	11 13.1	8 10.9	- 0 23.2	+0.2032	0.5131	0.2261	+50	-31
μ Libræ	5.7	1.42	8.5	13 41.7	21 15.4	-11 42.3	-0.0197	0.5225	0.2154	+36	-43
ν^1 Libræ	5.5	+1.51	-8.8	-15 50.1	**18** 5 44.2	- 3 29.3	+0.4804	0.5293	-0.2063	+63	-16
ν^2 Libræ	6.9	1.51	8.9	16 3.8	5 48.9	- 3 24.5	+0.7063	0.5293	0.2061	+74	- 4
28 Libræ	6.0	1.58	9.0	17 45.9	12 32.9	+ 3 6.5	+1.1580	0.5347	0.1979	+72	+28
ζ^1 Libræ	6.0	1.61	8.5	16 20.3	16 3.3	+ 6 30.0	-1.0460	0.5375	0.1933	-24	-90
ζ^2 Libræ	7.0	1.62	8.6	17 4.0	16 40.1	+ 7 5.6	-0.3911	0.5384	0.1924	+14	-66
41 Libræ	5.9	+1.66	-8.8	-18 56.6	20 58.8	+11 15.7	+0.7843	0.5420	-0.1864	+71	+ 1
κ Libræ	5.1	1.68	8.8	19 19.6	22 22.9	-11 23.0	+0.9292	0.5438	0.1845	+71	+11
λ Libræ	5.1	1.73	8.5	19 50.5	**19** 3 34.9	- 6 21.5	+0.5352	0.5483	0.1761	+62	-13
47 Libræ	6.4	1 73	8.3	19 3.7	4 21.3	- 5 36.8	-0.4243	0.5487	0.1749	+10	-68
β^1 Scorpii	2.9	1.77	8.1	19 30.5	9 2.0	- 1 5.2	-0.7538	0.5521	0.1678	- 9	-90
β^2 Scorpii	5.5	+1.77	-8.1	-19 30.3	9 2.1	- 1 5.1	-0.7583	0.5521	-0.1678	- 9	-90
ω^1 Scorpii	4.6	1.78	8.2	20 22.5	9 37.6	- 0 31.2	+0.0632	0.5535	0.1656	+33	-38
ω^2 Scorpii	4.6	1.79	8.2	20 34.5	9 53.2	- 0 16.2	+0.2298	0.5536	0.1653	+42	-29
ω Ophiuchi	4.7	1.87	7.4	21 14.0	20 41.6	+10 9.3	-0.7537	0.5635	0.1445	-12	-90
39 Ophiuchi *mult.*	5.5	2.04	5.9	24 10.2	**20** 15 50.6	+ 4 35.7	-0.0535	0.5785	0.1008	+21	-45
θ Ophiuchi	3.3	+2.06	-5.7	-24 53.6	17 27.3	+ 6 8.7	+0.5370	0.5798	-0.0969	+54	-12
b Ophiuchi *var.*	4 4	2.05	5.4	24 4.6	19 14.4	+ 7 51.7	-0.4758	0.5809	0.0923	- 3	-74
c^2 Ophiuchi	5.2	2.06	5.2	23 52.8	21 16.8	+ 9 49.4	-0.8638	0.5827	0.0873	-24	-90
λ Sagittarii	2.9	2.15	2.3	25 28.8	**21** 19 32.6	+ 7 12.5	-0.4726	0.5944	0.0252	- 9	-74
ϕ Sagittarii	3.7	2.17	1.3	27 6.1	**22** 2 19.9	-10 16.6	+1.0800	0.5960	-0.0053	+63	+27
σ Sagittarii	2.3	+2.15	-0.6	-26 25.9	6 2.8	- 6 43.0	+0.3979	0.5976	+0.0059	+37	-19
ψ Sagittarii	5.4	2.12	+0.3	25 26.6	13 49.9	+ 0 45.3	-0.4712	0.5980	0.0294	- 9	-74
h^1 Sagittarii *var.*	6.0	2.10	1.4	24 57.5	21 41.9	+ 8 17.9	-0.6430	0.5980	0.0526	-15	-90
h^2 Sagittarii	4.6	2.10	1.4	25 7.4	21 56.9	+ 8 32.5	-0.4603	0.5980	0.0534	- 6	-73
χ Capricorni	5.4	1.77	5.8	21 37.8	**24** 9 52.8	- 4 58.0	-0.2497	0.5827	0.1508	+15	-57
27 Capricorni	6.5	+1.76	+5.7	-20 59.5	10 16.8	- 4 35.0	-0.8310	0.5826	+0.1516	-16	-90
ϕ Capricorni	5.5	1.73	6.0	21 6.2	12 43.9	- 2 13.5	-0.3406	0.5816	0.1575	+11	-63
33 Capricorni	5.7	1.70	6.5	21 18.8	16 11.3	+ 1 5.8	+0.4306	0.5793	0.1654	+53	-18
35 Capricorni	6.2	1.69	6.6	21 39.9	17 26.5	+ 2 18.1	+0.9919	0.5781	0.1683	+68	+16
37 Capricorni	6.0	1.64	6.7	20 34.1	20 33.9	+ 5 18.5	+0.4239	0.5765	0.1750	+54	-19
ε Capricorni	4.7	+1.62	+6.6	-19 57.2	21 28.9	+ 6 11.5	-0.0318	0.5758	+0.1770	+29	-44
κ Capricorni	5.0	1.59	6.7	19 21.6	23 46.9	+ 8 24.2	-0.2145	0.5745	0.1808	+20	-54
B. A. C. 7550	6.3	1.60	6.9	20 7.0	**25** 0 0.9	+ 8 37.7	+0.5882	0.5745	0.1822	+65	-10
29 Aquarii *mult.*	6.5	1.48	6.9	17 29.2	8 3.3	- 7 38.0	-0.5278	0.5693	0.1977	+ 6	-76
56 Aquarii	6.3	1.33	7.2	15 8.4	19 57.8	+ 3 50.5	-0.4127	0.5626	0.2178	+14	-67
τ^1 Aquarii *mult.*	5.8	+1.23	+7.6	-14 37.7	**26** 3 33.8	+11 10.2	+0.7684	0.5572	+0.2284	+71	0
τ^2 Aquarii	4.1	1.22	7.5	14 10.0	4 23.8	+11 58.4	+0.4950	0.5563	0.2294	+65	-16
74 Aquarii	6.0	1.18	7.0	12 11.7	6 6.8	-10 21.8	-1.0940	0.5554	0.2315	-24	-90
ψ^1 Aquarii	4.1	1.05	6.9	9 40.7	16 6.5	- 0 42.9	-1.2530	0.5493	0.2425	-37	-90
ψ^2 Aquarii	4.2	1.04	7.0	9 46.6	17 2.1	+ 0 10.8	-0.9311	0.5490	0.2433	-11	-90
ψ^3 Aquarii	4.8	+1.04	+7.1	-10 12.5	17 30.6	+ 0 38.3	-0.3849	0.5490	+0.2440	+19	-65
B. A. C. 8274	7.0	0.85	6.8	6 59.1	**27** 7 2.2	-10 17.5	-0.2575	0.5432	0.2546	+27	-56
30 Piscium	4.6	0.78	7.0	6 37.1	13 15.4	- 4 16.8	+0.9645	0.5405	0.2575	+83	+10
33 Piscium	4.7	0.76	6.9	6 18.9	14 49.9	- 2 45.4	+1.0640	0.5399	0.2580	+84	+17
B. A. C. 17	6.0	0.73	6.9	5 51.1	17 9.3	- 0 30.5	+1.1980	0.5398	0.2593	+84	+28
14 Ceti	6.0	+0.57	+5.7	- 1 6.2	**28** 5 0.2	+10 57.0	-0.5186	0.5363	+0.2618	+15	-74
15 Ceti	6.8	0.55	5.6	- 1 6.2	6 12.4	-11 53.1	-0.2027	0 5360	0.2618	+31	-53
26 Ceti	5.9	0.41	5.5	+ 0 47.1	18 23.3	- 0 5.9	+1.0720	0.5352	0.2610	+90	+18
29 Ceti	6.3	0.38	5.3	1 25.5	20 21.9	+ 1 48.9	+0.9356	0.5351	0.2605	+90	+ 9
33 Ceti	6.1	0.37	5.2	1 52.1	21 35.3	+ 2 59.8	+0.8033	0.5350	0.2602	+90	+ 1
35 Ceti	6.3	+0.36	+5.2	+ 1 53.8	22 31.4	+ 3 54.2	+1.0170	0.5348	+0.2597	+90	+14
f Piscium	5.1	+0.33	+4.9	+ 3 2.5	**29** 1 1.2	+ 6 19.1	+0.5008	0.5354	+0.2593	+72	-16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
μ Piscium	5.0	+0.26	+4.2	+ 5 34.9	29 6 51.3	+11 57.9	−0.5822	0.5354	+0.2564	+12	−77
ξ Arietis	5.3	−0.01	3.5	10 7.1	30 8 31.0	−11 12.7	+1.1400	0.5399	0.2352	+90	+27
31 Arietis	5.7	0.08	3.0	11 58.6	13 57.4	− 5 57.1	+0.5060	0.5426	0.2310	+74	−12
σ Arietis	5.5	−0.15	+2.4	+14 38.0	20 46.3	+ 0 38.1	−0.6837	0.5450	+0.2226	+ 5	−75

JULY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
13 Tauri	5.7	−0.36	+1.8	+19 21.0	1 19 35.8	− 1 19.1	−0.8702	0.5544	+0.1873	− 7	−71
14 Tauri	6.3	0.36	1.9	19 19.2	20 14.6	− 0 41.7	−0.7180	0.5546	0.1860	+ 2	−71
B. A. C. 1242	6.3	0.42	2.1	19 53.6	2 3 51.8	+ 6 39.4	+0.0486	0.5581	0.1719	+45	−28
ω² Tauri	5.7	−0.47	+2.2	+20 18.6	10 53.3	−10 34.0	+0.7722	0.5609	+0.1578	+90	+11
51 Tauri	6.0	0.48	2.1	21 18.8	11 20.8	−10 7.3	−0.2017	0.5609	0.1567	+31	−40
53 Tauri	6.0	0.48	2.2	20 52.7	11 48.7	− 9 40.4	+0.3235	0.5609	0.1557	+61	−12
56 Tauri	6.0	0.48	2.1	21 30.6	11 52.6	− 9 36.7	−0.3235	0.5609	0.1557	+24	−46
κ¹ Tauri	4.7	0.50	2.1	22 2.6	14 21.0	− 7 13.6	−0.5017	0.5624	0.1505	+14	−57
κ² Tauri	6.3	−0.50	+2.0	+21 57.0	14 22.3	− 7 12.3	−0.4024	0.5624	+0.1505	+20	−51
ν¹ Tauri	4.7	0.50	2.0	22 33.9	14 44.6	− 6 50.8	−0.9895	0.5627	0.1496	−16	−67
ν² Tauri	6.0	0.51	2.0	22 45.0	15 10.2	− 6 26.1	−1.1180	0.5627	0.1486	−27	−67
B. A. C. 1373	6.0	0.50	2.0	21 22.4	15 30.2	− 6 6.8	+0.3693	0.5641	0.1479	+65	−10
τ Tauri	4.5	0.55	2.3	22 44.9	21 35.1	− 0 15.1	−0.2094	0.5649	0.1346	+30	−38
99 Tauri	6.0	−0.59	+2.4	+23 46.6	3 4 11.5	+ 6 6.9	−0.4519	0.5681	+0.1192	+17	−50
103 Tauri	6.0	0.60	2.6	24 7.2	8 32.6	+10 18.4	−0.3152	0.5681	0.1088	+24	−41
118 Tauri	5.7	0.64	2.8	25 3.7	17 26.2	− 5 7.6	−0.7874	0.5720	0.0870	− 4	−65
121 Tauri	6.0	0.64	3.0	23 57.9	20 2.9	− 2 36.7	+0.9404	0.5703	+0.0803	+90	+30
				NEW	*MOON.*						
ξ Cancri	5.0	−0.39	+5.4	+22 29.3	7 16 52.3	− 9 6.5	−0.7669	0.5389	−0.1408	− 1	−68
79 Cancri	6.3	0.38	5.4	22 26.4	17 20.4	− 8 39.4	−0.7796	0.5388	0.1416	− 2	−68
B. A. C. 3138	6.3	0.37	5.2	21 44.0	18 54.2	− 7 8.6	−0.2314	0.5374	0.1444	+29	−41
B. A. C. 3206	6.3	0.34	4.9	20 15.6	8 0 15.0	− 1 58.1	+0.5839	0.5337	0.1539	+82	+ 1
η Leonis	3.3	−0.16	+4.0	+17 17.6	21 18.0	− 5 24.5	+0.2698	0.5196	−0.1846	−58	−20
42 Leonis	6.0	0.11	3.5	15 31.5	9 4 44.1	+ 1 38.3	+0.8108	0.5152	0.1941	+90	+ 8
i Leonis	5.7	0.07	3.2	14 41.8	10 6.8	+ 6 51.4	+0.6619	0.5115	0.2004	+88	− 1
k Leonis	5.7	−0.01	3.0	14 46.2	17 35.7	− 9 52.6	−0.9450	0.5076	0.2078	−10	−75
ι Leonis *mult.*	4.1	+0.15	1.7	11 7.8	10 13 49.6	+ 9 47.0	−1.2990	0.4981	0.2240	−39	−79
ω Virginis	5.9	+0.20	+0.8	+ 8 44.3	21 51.7	− 6 24.2	−0.4706	0.4955	−0.2289	+17	−68
ν Virginis	4.0	0.24	+0.3	7 8.4	11 1 58.3	− 2 24.8	+0.3562	0.4941	0.2310	+62	−22
c Virginis	5.5	0.40	−1.1	+ 3 55.2	21 18.6	− 7 35.4	−0.6256	0.4913	0.2382	+ 9	−82
46 Virginis	6.1	0.60	3.8	− 2 46.9	12 19 54.2	− 9 36.3	+1.3620	0.4920	0.2405	+87	+46
48 Virginis	6.7	0.62	3.9	3 4.6	21 45.2	− 7 48.3	+1.2410	0.4926	0.2403	+87	+31
65 Virginis	6.1	+0.73	−4.5	− 4 21.4	13 8 32.8	+ 2 41.6	+0.0623	0.4948	−0.2385	+45	−39
66 Virginis	6.0	0.74	4.6	4 35.7	9 13.1	+ 3 20.8	+0.1630	0.4951	0.2385	+51	−33
*l*¹ Virginis	5.1	0.78	5.0	5 41.7	13 18.9	+ 7 19.9	+0.3968	0.4961	0.2373	+64	−21
80 Virginis	6.1	0.80	4.7	4 50.5	15 16.1	+ 9 13.9	−1.0040	0.4971	0.2368	−14	−90
88 Virginis	6.8	0.89	5.3	6 17.7	22 14.0	− 7 59.8	−1.0500	0.5000	0.2343	−18	−90
B.A.C. 4647 *mult.*	6.4	+0.93	−5.7	− 7 31.4	14 1 50.2	− 4 29.6	−0.5446	0.5012	−0.2326	+12	−76
W. xiii, 825	6.8	0.93	6.2	9 1.6	2 15.5	− 4 5.0	+0.9949	0.5015	0.2325	+81	+13
91 Virginis	6.8	0.99	6.0	8 22.4	7 53.1	+ 1 23.0	−1.0130	0.5042	0.2296	−16	−90
95 Virginis	6.0	1.00	6.1	8 47.7	8 6.8	+ 1 36.3	−0.6036	0.5046	0.2295	+ 9	−81
96 Virginis	6.9	1.01	6.5	9 49.2	9 18.9	+ 2 46.3	+0.2359	0.5047	0.2286	+53	−29
κ Virginis	4.2	+1.03	−6.5	− 9 46.1	11 22.3	+ 4 46.2	−0.2868	0.5047	−0.2276	+24	−58
2 Libræ	6.5	1.10	6.9	11 13.1	16 53.4	+10 7.7	+0.0434	0.5085	0.2236	+41	−40
μ Libræ	5.7	1.26	7.7	13 41.7	15 6 9.0	− 1 0.3	−0.1708	0.5182	0.2128	+28	−51
ι¹ Libræ	5.5	1.37	8.2	15 50.1	14 44.5	+ 7 19.5	+0.3417	0.5246	0.2036	+54	−24
ι² Libræ	6.9	1.38	8.3	16 3.8	14 49.9	+ 7 24.7	+0.5689	0.5248	0.2034	+68	−12
28 Libræ	6.0	+1.47	−8.5	−17 45.9	21 39.4	− 9 58.7	+1.0320	0.5319	−0.1961	+72	+17
31 Libræ	6.0	+1.50	−8.0	−16 20.3	16 1 12.4	− 6 32.5	−1.0160	0.5328	−0.1910	−36	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					LIMITING PARALLELS.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ζ^2 Libræ	5.7	+1.52	- 8.2	-17 4.0	**16** 1 49.8	- 5 56.3	-0.5231	0.5337	-0.1901	+ 7	-76
41 Libræ	5.9	1.59	8.5	18 56.6	6 11.6	- 1 43.0	+0.6625	0.5380	0.1842	+70	- 6
κ Libræ	5.1	1.61	8.6	19 19.6	7 36.9	- 0 20.6	+0.8085	0.5389	0.1818	+71	+ 3
λ Libræ	5.1	1.68	8.2	19 50.5	12 52.5	+ 4 44.6	+0.4187	0.5434	0.1737	+54	-19
47 Libræ	6 4	1.69	8.2	19 3.7	13 39.3	+ 5 29.8	-0.5424	0.5441	0.1724	+ 4	-78
β^1 Scorpii	2.9	+1.72	- 8.1	-19 30.5	18 23.1	+10 4.0	-0.8662	0.5484	-0.1644	-16	-90
β^2 Scorpii	5.5	1.72	8.1	19 30.3	18 23.2	+10 4.1	-0.8698	0.5484	0.1644	-16	-90
ω^1 Scorpii	4.6	1.76	8.2	20 22.5	18 59.1	+10 38.8	-0.0493	0.5494	0.1634	+27	-45
ω^2 Scorpii	4.6	1.77	8.3	20 34.5	19 14.8	+10 53.9	+0.1197	0.5493	0.1628	+36	-35
ω Ophiuchi	4.7	1.89	7.7	21 14.0	**17** 6 9.2	- 2 34.6	-0.8513	0.5597	0.1423	-18	-90
22 Ophiuchi	6.7	+2.04	- 7.3	-23 20.0	15 48.8	+ 6 44.0	+0.0695	0.5689	-0.1217	+29	-38
24 Ophiuchi	6.0	2.04	7.1	22 58.7	16 38.4	+ 7 31.8	-0.4011	0.5692	0.1199	+ 5	-67
39 Ophiuchi *mult.*	5.5	2.14	6.5	24 10.2	**18** 1 24.3	- 8 2.0	-0.1226	0.5765	0.0993	+16	-49
θ Ophiuchi	3.3	2.17	6.5	24 53.6	3 1.3	- 6 28.7	+0.4714	0.5785	0.0954	+50	-15
b Ophiuchi *var.*	4.4	2.16	6.2	24 4.6	4 48.6	- 4 45.5	-0.5414	0.5791	0.0907	- 6	-80
c^3 Ophiuchi	5.2	+2.18	- 5.9	-23 52.8	6 51.2	- 2 47.6	-0.9241	0.5805	-0.0852	-28	-90
B. A C. 6194	5.1	2.37	4.0	27 5.0	**19** 1 11.8	- 9 10.4	+1.2530	0.5936	0.0349	+63	+52
λ Sagittarii	2.9	2.39	3.1	25 28.9	5 3.8	- 5 27.8	-0.4965	0.5960	0.0238	-10	-76
φ Sagittarii	3.7	2.44	2.2	27 6.1	11 48.3	+ 1 0.3	+1.0610	0.5988	-0.0036	+63	+25
σ Sagittarii	2.3	2.47	1.5	26 25.9	15 29.0	+ 4 31.8	+0.3851	0.5991	+0.0074	+36	-20
ψ Sagittarii	5.4	+2.46	- 0.1	-25 26.6	23 11.4	+11 55.1	-0.4663	0.6012	+0.0289	- 8	-74
h^1 Sagittarii *var.*	6.0	2.48	+ 1.2	24 57.5	**20** 6 56.7	- 4 38.8	-0.6209	0.6018	0.0545	-14	-88
h^2 Sagittarii	4.6	2.48	1.3	25 7.4	7 11.8	- 4 24.4	-0.4413	0.6020	0.0554	- 5	-71
χ Capricorni	5.4	2.38	7.1	21 37.8	**21** 18 24.9	+ 5 22.3	-0.1691	0.5913	0.1546	+20	-52
φ Capricorni	5.5	2.35	7.4	21 6.2	21 11.8	+ 8 2.6	-0.2537	0.5902	0.1615	+16	-57
33 Capricorni	5.7	+2.35	+ 7.9	-21 18.8	**22** 0 33.9	+11 16.6	+0.5133	0.5875	+0.1692	+58	-14
35 Capricorni	6.2	2.35	8.1	21 39.9	1 47.2	-11 33.0	+1.0720	0.5867	0.1722	+68	+22
37 Capricorni	6.0	2.32	8.3	20 34.1	4 49.8	- 8 37.5	+0.5148	0.5854	0.1792	+59	-14
ε Capricorni	4.7	2.31	8.4	19 57.2	5 43.6	- 7 45.8	+0.0662	0.5848	0.1811	+34	-38
κ Capricorni	5.0	2.29	8.6	19 21.6	7 57.9	- 5 36.8	-0.1126	0.5834	0.1861	+25	-48
B. A. C. 7550	6.3	+2.30	+ 8.7	-20 7.0	8 11.5	- 5 23.6	+0.6820	0.5834	+0.1866	+69	- 5
29 Aquarii *mult*	6.5	2.22	9.3	17 29.2	16 0.9	+ 2 7.6	-0.4050	0.5773	0.2022	+12	-67
56 Aquarii	6.3	2.09	10.2	15 8.3	**23** 3 35.6	-10 43.6	-0.2727	0.5705	0.2232	+22	-58
τ^1 Aquarii *mult.*	5.8	2.00	10.9	14 37.6	10 58.8	- 3 36.7	+0.9008	0.5649	0.2329	+75	+ 7
τ^2 Aquarii	4.1	1.98	10.9	14 9.9	11 47.4	- 2 49.9	+0.6357	0.5654	0.2345	+74	- 8
74 Aquarii	6.0	+1.95	+10.7	-12 11.6	13 28.0	- 1 12.9	-0.9305	0.5642	+0.2366	-13	-90
ψ^1 Aquarii	4.1	1.83	11.0	9 40.6	23 11.0	+ 8 9.2	-1.0775	0.5575	0.2472	-21	-90
ψ^2 Aquarii	4.2	1.83	11.1	9 46.5	**24** 0 5.1	+ 9 1.4	-0.7582	0.5569	0.2480	- 1	-90
ψ^3 Aquarii	4.8	1.82	11.2	10 12.2	0 32.9	+ 9 28.2	-0.2185	0.5569	0.2484	+28	-54
B. A. C. 8274	7.0	1.66	11.4	6 59.0	13 43.1	- 1 49.0	-0.0748	0.5503	0.2586	+37	-46
30 Piscium	4.6	+1.60	+11.7	- 6 37.0	19 47.1	+ 4 2.5	+1.1380	0.5480	+0.2617	+83	+23
33 Piscium	4.7	1.58	11.7	6 18.8	21 19.3	+ 5 31.5	+1.2400	0.5470	0.2623	+84	+31
14 Ceti	6.0	1.41	10.9	1 6.1	**25** 11 10.7	- 5 5.0	-0.3144	0.5421	0.2653	+25	-60
15 Ceti	6.8	1.40	10.9	- 1 6.1	12 21.4	- 3 56.6	-0.0034	0.5418	0.2653	+42	-42
26 Ceti	5.9	1.26	10.7	+ 0 47.2	**26** 0 18.6	+ 7 36.9	+1.2640	0.5396	0.2637	+90	+33
29 Ceti	6.3	+1.24	+10.6	+ 1 25.6	2 15.3	+ 9 29.7	+1.1310	0.5391	+0.2628	+90	+22
33 Ceti	6.1	1.23	10.4	1 52.1	3 27.5	+10 39.5	+1.0010	0.5396	0.2626	+90	+13
35 Ceti	6.3	1.22	10.5	1 53.8	4 22.8	+11 33.0	+1.2170	0.5394	0.2622	+90	+29
f Piscium	5.1	1.19	10.2	3 2.5	6 50.2	-10 4.5	+0.7053	0.5388	0.2609	+90	- 5
μ Piscium	5.0	1.12	9.5	5 34.9	12 35.6	- 4 30.4	-0.3710	0.5383	0.2580	+23	-63
ξ Arietis	5.3	+0.85	+ 8.4	+10 7.1	**27** 14 1.5	- 3 54.8	+1.3380	0.5412	+0.2368	+90	+48
31 Arietis	5.7	0.79	7.8	11 58.6	19 26.8	+ 1 19.6	+0.7026	0.5419	0.2302	+90	- 1
σ Arietis	5.5	0.72	7.0	14 38.0	**28** 2 15.0	+ 7 54.2	-0.4877	0.5439	0.2216	+16	-64
13 Tauri	5.7	0.48	5.4	19 21.1	**29** 1 8.3	+ 6 0.7	-0.7001	0.5516	0.1854	+ 4	-70
14 Tauri	6.3	0.47	5.5	19 19.3	1 47.3	+ 6 38.3	-0.5494	0.5514	0.1841	+12	-64
B. A. C. 1242	6.3	+0.40	+ 5.2	+19 53.7	9 27.6	- 9 57.4	+0.2104	0.5542	+0.1698	+54	-20
ω^2 Tauri	5.7	+0.34	+ 5.1	+20 18.7	16 32.7	- 3 7.3	+0.9286	0.5571	+0.1555	+90	+21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
				JULY.							
51 Tauri	6.0	+0.33	+4.8	+21 18.9	29 17 0.6	− 2 40.3	−0.0489	0.5572	+0.1545	+39	−31
53 Tauri	6.0	0.33	4.9	20 52.8	17 28.8	− 2 13.1	+0.4782	0.5572	0.1536	+73	− 5
56 Tauri	6.0	0.33	4.7	21 30.7	17 32.7	− 2 9.4	−0.1728	0.5572	0.1535	+32	−38
κ^1 Tauri	4.7	0.30	4.6	22 2.7	20 2.5	+ 0 15.1	−0.3548	0.5588	0.1483	+22	−48
κ^2 Tauri	6.3	0.30	4.6	21 57.1	20 3.9	+ 0 16.5	−0.2534	0.5588	0.1483	+28	−42
υ^1 Tauri	4.7	+0.30	+4.4	+22 34.0	20 26.4	+ 0 38.2	−0.8443	0.5588	+0.1472	− 6	−67
υ^2 Tauri	6.0	0.30	4.4	22 45.1	20 52.2	+ 1 3.0	−0.9736	0.5586	0.1463	−15	−67
B. A. C. 1373	6.0	0.30	4.8	21 22.5	21 12.3	+ 1 22.5	+0.5174	0.5585	0.1454	+76	− 1
τ Tauri	4.5	0.24	4.4	22 45.0	30 3 21.1	+ 7 18.1	−0.0718	0.5603	0.1324	+38	−30
95 Tauri	6.3	0.24	4.0	23 53.0	3 45.2	+ 7 41.4	−1.2110	0.5613	0.1314	−38	−66
99 Tauri	6.0	+0.18	+4.0	+23 46.7	10 2.0	−10 15.4	−0.3217	0.5628	+0.1169	+24	−42
103 Tauri	6.0	0.15	4.0	24 7.3	14 26.3	− 6 0.6	−0.1919	0.5635	0.1065	+31	−34
118 Tauri	5.7	0.08	3.7	25 3.7	23 26.6	+ 2 40.0	−0.3251	0.5654	0.0847	+24	−40
121 Tauri	6.0	0.06	3.9	23 57.9	31 2 5.7	+ 5 13.4	+1.0550	0.5662	0.0783	+90	+38
125 Tauri	6.0	0.05	3.4	25 50.2	3 52.2	+ 6 55.9	−0.7982	0.5667	0.0738	− 4	−64
132 Tauri	5.3	+0.02	+3.7	+24 31.8	7 50.2	+10 45.3	+0.8654	0.5666	+0.0638	+90	+27
139 Tauri	5.3	−0.01	+3.4	+25 56.4	11 36.7	− 9 36.5	−0.4138	0.5672	+0.0544	+19	−43
				AUGUST.							
ε Geminorum	3.2	−0.13	+3.9	+25 14.3	1 7 7.1	+ 9 11.1	+0.9141	0.5663	+0.0043	+90	+35
37 Geminorum	6.3	0.15	3.9	25 30.8	11 58.1	−10 8.5	+0.6110	0.5654	−0.0081	+88	+17
39 Geminorum	6.3	0.16	3.8	26 13.5	13 26.8	− 8 43.0	−0.1702	0.5648	0.0118	+32	−24
40 Geminorum	6.3	0.16	3.9	26 3.9	13 43.8	− 8 26.6	−0.0018	0.5648	0.0125	+42	−15
47 Geminorum	6.0	0.18	3.8	27 2.2	18 49.6	− 3 31.8	−1.1460	0.5645	0.0253	−34	−63
52 Geminorum	6.3	−0.19	+4.1	+25 4.5	20 17.5	− 2 7.1	+0.9296	0.5637	−0.0292	+90	+34
A Geminorum	5.7	0.20	4.0	25 15.6	2 0 5.1	+ 1 32.3	+0.6025	0.5618	0.0384	+87	+14
κ Geminor. *mult.*	3.6	0.21	4.1	24 39.7	9 13.6	+10 21.2	+0.7996	0.5586	0.0607	+90	+23
				NEW	*MOON.*						
η Leonis	3.3	−0.15	+3.7	+17 17.7	5 4 26.9	+ 3 22.1	+0.1508	0.5195	−0.1868	+51	−26
i Leonis	5.7	0.11	3.3	14 41.9	17 17.0	− 8 10.7	+0.5222	0.5131	0.2023	+75	− 9
k Leonis	5.7	−0.07	3.1	14 46.3	6 0 46.5	− 0 54.2	−1.1020	0.5081	0.2099	−21	−75
ω Virginis	5.9	+0.05	1.6	8 44.4	7 5 4.4	+ 2 36.1	−0.6778	0.4967	0.2310	+ 6	−81
ν Virginis	4.0	0.06	+1.2	7 8.4	9 11.4	+ 6 36.3	+0.1463	0.4954	0.2320	+50	−33
c Virginis	5.5	+0.18	0.0	+ 3 55.2	8 4 34.9	+ 1 28.5	−0.8650	0.4913	−0.2394	− 4	−86
46 Virginis	6.1	0.33	−2.4	− 2 46.9	9 3 17.7	− 0 25.2	+1.1055	0.4902	0.2404	+87	+20
48 Virginis	6.7	0.35	2.5	3 4.6	5 9.4	+ 1 23.5	+0.9854	0.4905	0.2402	+87	+11
65 Virginis	6.1	0.43	3.1	4 21.3	16 2.5	+11 59.0	−0.2081	0.4928	0.2382	+31	−54
66 Virginis	6.0	0.44	3.2	4 35.6	16 43.2	−11 21.9	−0.1050	0.4932	0.2382	+35	−48
l^2 Virginis	5.1	+0.47	−3.6	− 5 41.7	20 51.4	− 7 19.9	+0.1289	0.4945	−0.2371	+48	−35
80 Virginis	6.1	0.49	3.3	4 50.5	22 49.9	− 5 24.7	−1.2830	0.4945	0.2361	−37	−90
88 Virginis	6.8	0.55	4.0	6 17.7	10 5 52.4	+ 1 26.3	−1.3280	0.4966	0.2332	−43	−90
B.A.C.4647 *mult.*	6.4	0.58	4.4	7 31.4	9 31.3	+ 4 59.1	−0.8239	0.4986	0.2316	− 5	−90
W. xiii, 825	6.8	0.58	4.9	9 1.6	9 56.9	+ 5 24.0	+0.7321	0.4987	0.2314	+80	− 3
94 Virginis	6.8	+0.64	−4.7	− 8 22.4	15 39.2	+10 56.8	−1.2970	0.5007	−0.2282	−40	−90
95 Virginis	6.0	0.65	4.9	8 47.7	15 53.0	+11 10.2	−0.8847	0.5010	0.2282	− 8	−90
96 Virginis	6.9	0.65	5.2	9 49.2	17 6.2	−11 38.7	−0.0384	0.5010	0.2271	+37	−44
κ Virginis	4.2	0.68	5.2	9 46.1	19 11.3	− 9 37.1	−0.5667	0.5024	0.2260	+10	−78
2 Libræ	6.5	0.73	5.7	11 13.1	11 0 47.0	− 4 11.0	−0.2299	0.5050	0.2221	+27	−55
5 Libræ	6.6	+0.87	−7.0	−15 0.1	12 31.5	+ 7 13.0	+1.3510	0.5125	−0.2124	+75	+51
μ Libræ	5.7	0.89	6.6	13 41.7	14 16.4	+ 8 54.9	−0.4446	0.5130	0.2106	+14	−69
ν^1 Libræ	5.5	1.00	7.3	15 50.1	23 1.4	− 6 35.8	+0.0796	0.5196	0.2015	+39	−38
ν^2 Libræ	6.9	1.00	7.4	16 3.8	23 7.0	− 6 30.4	+0.3091	0.5195	0.2013	+52	−25
28 Libræ	6.0	1.09	7.8	17 45.9	12 6 4.4	+ 0 14.1	+0.7764	0.5243	0.1938	+73	0
ζ^4 Libræ	7.0	+1.15	−7.5	−17 4.0	10 19.8	+ 4 21.5	−0.7861	0.5266	−0.1870	− 8	−90
41 Libræ	5.9	+1.21	−8.0	−18 56.6	14 47.0	+ 8 40.3	+0.4140	0.5313	−0.1810	+56	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
κ Libræ	5.1	+1.23	− 8.1	−19 19.6	12 16 14.1	+10 4.5	+0.5662	0.5325	−0.1791	+64	−11
λ Libræ	5.1	1.31	8.1	19 50.5	21 36.4	− 8 43.6	+0.1768	0.5371	0.1709	+40	−32
47 Libræ	6.4	1.32	7.8	19 3.7	22 24.1	− 7 57.5	−0.7947	0.5385	0.1696	−11	−90
β¹ Scorpii	2.9	1.39	7.8	19 30.5	13 3 14.0	− 3 17.2	−1.1130	0.5418	0.1615	−33	−90
β² Scorpii	5.5	1.39	7.8	19 30.3	3 14.1	− 3 17.1	−1.1170	0.5418	0.1615	−33	−90
ω¹ Scorpii	4.6	+1.40	− 8.0	−20 22.5	3 50.8	− 2 41.6	−0.2865	0.5425	−0.1605	+15	−59
ω² Scorpii	4.6	1.41	8.1	20 34.5	4 6.8	− 2 26.2	−0.1168	0.5426	0.1602	+24	−49
ω Ophiuchi	4.7	1.57	7.7	21 14.0	15 15.2	+ 8 19.4	−1.0850	0.5528	0.1395	−34	−90
22 Ophiuchi	6.7	1.75	7.6	23 20.0	14 1 7.1	− 6 9.7	−0.1386	0.5613	0.1191	+18	−50
24 Ophiuchi	6.0	1.76	7.5	22 58.7	1 57.8	− 5 20.8	−0.6141	0.5630	0.1174	− 7	−87
B. A. C. 5709	6.3	+1.79	− 8.0	−24 55.6	3 16.5	− 4 5.0	+1.2835	0.5627	−0.1142	+65	+53
26 Ophiuchi	6.1	1.80	8.0	24 49.5	3 21.4	− 4 0.2	+1.1680	0.5627	0.1140	+65	+34
39 Ophiuchi *mult.*	5.5	1.90	7.4	24 10.2	10 54.5	+ 3 16.2	−0.3188	0.5694	0.0967	+ 7	−62
B. A. C. 5831	6.5	1.89	7.4	23 57.2	10 57.0	+ 3 18.6	−0.5488	0.5694	0.0965	− 6	−80
θ Ophiuchi	3.3	1.92	7.4	24 53.6	12 33.3	+ 4 51.4	+0.2822	0.5717	0.0927	+38	−26
b Ophiuchi *var.*	4.4	+1.94	− 6.9	−24 4.6	14 22.7	+ 6 36.7	−0.7303	0.5722	−0.0881	−16	−90
c² Ophiuchi	5.2	1.97	6.9	23 52.8	16 27.7	+ 8 36.9	−1.1160	0.5740	0.0827	−43	−90
63 Ophiuchi	6.6	2.13	6.6	24 52.0	15 1 58.6	− 6 14.0	−0.7598	0.5824	0.0582	−22	−90
B. A. C. 6194	5.1	2.28	6.1	27 5.0	11 7.6	+ 2 33.5	+1.1370	0.5876	0.0331	+63	+32
λ Sagittarii	2.9	2.31	4.9	25 28.9	15 3.1	+ 6 19.6	−0.6409	0.5896	0.0217	−17	−90
B. A. C. 6369	6.2	+2.38	− 3.2	−25 7.1	21 36.4	−11 22.9	−1.0900	0.5933	−0.0024	−48	−90
φ Sagittarii	3.7	2.42	3.7	27 6.1	21 53.0	−11 7.0	+0.9367	0.5937	−0.0017	+63	+15
σ Sagittarii	2.3	2.45	2.8	26 25.9	16 1 36.3	− 7 32.7	+0.2670	0.5957	+0.0095	+30	−27
ψ Sagittarii	5.4	2.51	1.0	25 26.6	9 23.6	− 0 4.6	−0.5727	0.5973	0.0329	−13	−83
χ¹ Sagittarii	5.4	2.54	− 0.2	24 43.2	13 7.2	+ 3 29.6	−1.1600	0.5984	0.0440	−50	−90
h¹ Sagittarii *var.*	6.0	+2.59	+ 0.5	−24 57.5	17 12.6	+ 7 25.2	−0.7093	0.5987	+0.0565	−18	−90
h² Sagittarii	4.6	2.58	0.5	25 7.4	17 27.8	+ 7 39.8	−0.5296	0.5988	0.0573	− 9	−79
χ Capricorni	5.4	2.70	7.2	21 37.8	18 4 39.9	− 6 34.6	−0.1749	0.5929	0.1576	+19	−52
φ Capricorni	5.5	2.69	7.6	21 6.2	7 25.5	− 3 55.6	−0.2508	0.5920	0.1646	+16	−57
33 Capricorni	5.7	2.70	8.2	21 18.8	10 45.8	− 0 43.4	+0.5205	0.5902	0.1728	+59	−14
35 Capricorni	6.2	+2.70	+ 8.4	−21 39.9	11 58.3	+ 0 26.2	+1.0790	0.5898	+0.1758	+68	+23
37 Capricorni	6.0	2.68	8.9	20 34.1	14 59.0	+ 3 19.8	+0.5328	0.5882	0.1827	+61	−13
ε Capricorni	4.7	2.66	9.1	19 57.2	15 52.2	+ 4 10.9	+0.0904	0.5879	0.1847	+36	−37
κ Capricorni	5.0	2.64	9.5	19 21.6	18 4.9	+ 6 18.3	−0.0821	0.5864	0.1895	+27	−47
τ¹ Aquarii *mult.*	5.8	2.50	13.2	14 37.6	20 37.2	+ 7 49.7	+0.9901	0.5725	0.2385	+75	+13
τ² Aquarii	4.1	+2.49	+13.3	−14 9.9	21 24.7	+ 8 35.4	+0.7266	0.5719	+0.2397	+75	− 3
ψ¹ Aquarii	4.1	2.39	14.1	9 40.6	20 8 31.9	− 4 41.9	−0.9345	0.5659	0.2532	−11	−90
ψ² Aquarii	4.2	2.38	14.2	9 46.5	9 24.5	− 3 51.2	−0.6170	0.5655	0.2542	+ 7	−83
ψ³ Aquarii	4.8	2.37	14.3	10 12.2	9 51.5	− 3 25.2	−0.0818	0.5652	0.2547	+35	−47
30 Piscium	4.6	2.23	15.3	6 37.0	21 4 33.3	− 9 28.4	+1.2985	0.5564	0.2680	+83	+37
14 Ceti	6.0	+2.10	+15.1	− 1 6.1	19 28.7	+ 5 0.8	−0.1020	0.5505	+0.2711	+37	−47
15 Ceti	6.8	2.09	15.0	− 1 6.1	20 37.2	+ 6 7.0	+0.2075	0.5505	0.2715	+53	−31
f Piscium	5.1	1.93	14.8	+ 3 2.6	22 14 31.0	− 0 35.9	+0.9303	0.5478	0.2668	+90	+ 9
μ Piscium	5.0	1.89	14.2	5 35.0	20 5.7	+ 4 47.3	−0.1198	0.5479	0.2637	+36	−48
31 Arietis	5.7	1.62	12.1	11 58.7	24 2 3.8	+ 9 44.2	+0.9627	0.5491	0.2338	+90	+15
o Arietis	6.0	+1.60	+11.1	+14 51.2	5 35.4	−10 51.5	−1.1390	0.5494	+0.2288	−24	−75
σ Arietis	5.5	1.57	11.1	14 38.1	8 41.8	− 7 51.5	−0.2135	0.5502	0.2244	+31	−48
13 Tauri	5.7	1.37	8.8	19 21.2	25 7 6.3	−10 13.9	−0.4279	0.5558	0.1864	+19	−56
14 Tauri	6.3	1.36	8.8	19 19.4	7 44.6	− 9 36.9	−0.2783	0.5558	0.1850	+27	−47
B. A. C. 1242	6.3	1.28	8.4	19 53.8	15 17.6	− 2 20.0	+0.4716	0.5578	0.1703	+72	− 7
A¹ Tauri	4.7	+1.29	+ 7.7	+21 47.1	16 48.5	− 0 52.4	−1.2290	0.5576	+0.1671	−38	−68
A² Tauri	6.3	1.28	7.7	21 43.0	17 5.1	− 0 36.3	−1.1110	0.5576	0.1665	−25	−68
ω² Tauri	5.7	1.22	8.0	20 18.7	22 16.9	+ 4 24.3	+1.1840	0.5593	0.1556	+90	+41
51 Tauri	6.0	1.22	7.7	21 18.9	22 44.3	+ 4 50.8	+0.2114	0.5595	0.1544	+55	−18
53 Tauri	6.0	1.21	7.7	20 52.8	23 12.4	+ 5 17.9	+0.7365	0.5595	0.1536	+90	+10
56 Tauri	6.0	+1.21	+ 7.5	+21 30.7	23 16.1	+ 5 21.4	+0.0884	0.5595	+0.1535	+47	−24
κ¹ Tauri	4.7	+1.19	+ 7.4	+22 2.7	26 1 44.2	+ 7 44.2	−0.0955	0.5602	+0.1479	+37	−33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
κ^2 Tauri	6.3	+1.19	+7.3	+21 57.1	26 1 45.5	+ 7 45.5	+0.0051	0.5602	+0.1479	+42	-28
ν^1 Tauri	4.7	1.19	6.8	22 34.0	2 7.8	+ 8 7.0	-0.5816	0.5602	0.1472	+10	-61
ν^2 Tauri	6.0	1.19	6.7	22 45.1	2 33.3	+ 8 31.5	-0.7117	0.5602	0.1460	+ 2	-67
B. A. C. 1373	6.0	1.18	7.3	21 22.5	2 53.2	+ 8 50.8	+0.7772	0.5611	0.1455	+90	+13
τ Tauri	4.5	1.13	6.6	22 45.0	8 58.2	- 9 17.4	+0.1816	0.5627	0.1318	+53	-17
95 Tauri	6.3	+1.13	+6.1	+23 53.0	9 22.1	- 8 54.4	-0.9528	0.5627	+0.1309	-14	-66
99 Tauri	6.0	1.07	5.9	23 46.7	15 35.8	- 2 54.2	-0.0770	0.5635	0.1161	+38	-29
k Tauri	6.0	1.07	5.5	24 53.0	15 43.3	- 2 47.0	-1.2230	0.5635	0.1158	-40	-65
103 Tauri	6.0	1.02	5.6	24 7.3	19 58.6	+ 1 19.0	+0.0491	0.5639	0.1081	+45	-22
118 Tauri	5.7	0.94	4.8	25 3.8	27 4 56.4	+ 9 57.2	-0.0952	0.5650	0.0836	+37	-27
125 Tauri	6.0	+0.90	+4.4	+25 50.3	9 21.3	- 9 47.6	-0.5741	0.5650	+0.0724	+10	-54
132 Tauri	5.3	0.85	4.6	24 31.9	13 18.8	- 5 58.7	+1.0810	0.5653	0.0622	+90	+42
139 Tauri	5.3	0.82	4.0	25 56.5	17 5.1	- 2 20.7	-0.1986	0.5653	0.0528	+31	-30
ε Geminorum	3.2	0.62	3.6	25 14.4	28 12 38.3	- 7 30.3	+1.1055	0.5641	+0.0027	+90	+48
37 Geminorum	6.3	0.58	3.4	25 30.8	17 30.7	- 2 48.5	+0.7900	0.5628	-0.0097	+90	+27
39 Geminorum	6.3	+0.57	+3.2	+26 13.5	19 0.0	- 1 22.5	+0.0072	0.5620	-0.0133	+43	-15
40 Geminorum	6.3	0.57	3.2	26 3.9	19 17.0	- 1 6.0	+0.1760	0.5619	0.0142	+53	- 7
47 Geminorum	6.0	0.53	2.8	27 2.2	29 0 24.4	+ 3 50.3	-0.9802	0.5611	0.0268	-18	-63
52 Geminorum	6.3	0.51	3.3	25 4.5	1 53.0	+ 5 15.8	+1.0970	0.5604	0.0307	+90	+46
A Geminorum	5.7	0.48	3.1	25 15.6	5 42.1	+ 8 56.7	+0.7617	0.5593	0.0401	+90	+23
c Geminorum	6.0	+0.40	+2.7	+26 2.7	14 44.3	- 6 20.3	-0.5489	0.5560	-0.0621	+11	-52
κ Geminor. *mult.*	3.6	0.40	3.0	24 39.7	14 54.8	- 6 10.2	+0.9439	0.5558	0.0622	+90	+32
ω^1 Cancri	6.0	0.35	3.0	25 41.5	22 13.4	+ 0 53.1	-0.6952	0.5520	0.0792	+ 2	-64
ω^2 Cancri	6.3	0.34	2.6	25 23.5	22 35.3	+ 1 14.2	-0.3957	0.5517	0.0801	+20	-43
ψ^1 Cancri	5.7	0.32	2.4	25 50.4	30 2 30.4	+ 5 1.3	-1.2160	0.5503	0.0886	-41	-64
λ Cancri	5.7	+0.29	+2.6	+24 22.0	7 6.3	+ 9 27.8	-0.0401	0.5478	-0.0989	+40	-25
ν^1 Cancri *mult*	6.0	0.28	2.4	24 53.6	9 53.6	-11 50.6	-0.8999	0.5460	0.1046	-11	-65
ν^2 Cancri	5.8	0.27	2.4	24 30.4	10 47.8	-10 58.2	-0.5685	0.5454	0.1066	+10	-57
ν^3 Cancri	6.0	0.26	2.4	24 27.0	12 7.8	- 9 40.9	-0.6558	0.5445	0.1093	+ 5	-63
ν^4 Cancri	5.7	0.26	2.4	24 27.4	12 48.9	- 9 1.2	-0.7377	0.5440	0.1108	0	-65
ξ Cancri	5.0	+0.18	+2.2	+22 29.3	31 5 55.1	+ 7 31.3	-0.7656	0.5348	-0.1438	- 1	-68
79 Cancri	6.3	0.17	2.2	22 26.4	6 23.5	+ 7 58.8	-0.7784	0.5343	0.1445	- 2	-68
B. A. C. 3138	6.3	0.16	2.3	21 44.0	7 58.5	+ 9 30.7	-0.2362	0.5329	0.1473	+29	-41
B. A. C. 3206	6.3	+0.14	+2.3	+20 15.6	13 23.6	- 9 14.5	+0.7156	0.5297	-0.1551	+90	+ 8

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
η Leonis	3.3	+0.07	+2.1	+17 17.7	1 10 39.6	+11 22.2	+0.1496	0.5183	-0.1666	+51	-26
				NEW	*MOON.*						
ε Virginis	5.5	+0.06	0.0	+ 3 55.2	4 11 0.8	+ 9 41.9	-1.0430	0.4918	-0.2417	-15	-86
46 Virginis	6.1	0.13	-1.6	- 2 46.9	5 9 45.5	+ 7 50.1	+0.8909	0.4917	0.2427	+87	+ 5
48 Virginis	6.7	0.14	1.7	3 4.6	11 37.5	+ 9 39.2	+0.7612	0.4917	0.2425	+80	- 2
65 Virginis	6.1	0.20	2.2	4 21.3	22 32.2	- 3 43.8	-0.4494	0.4931	0.2400	+18	-69
66 Virginis	6.0	0.20	2.3	4 35.6	23 13.0	- 3 4.1	-0.3476	0.4932	0.2399	+23	-62
l^2 Virginis	5.1	+0.22	-2.6	- 5 41.7	6 3 22.0	+ 0 58.2	-0.1183	0.4945	-0.2386	+35	-49
m Virginis	5.4	0.24	3.4	8 9.2	8 42.6	+ 6 10.9	+1.3360	0.4949	0.2362	+82	+42
B A.C.4647 *mult.*	6.4	0.30	3.4	7 31.4	16 5.6	-10 39.1	-1.0920	0.4971	0.2325	-21	-90
W xiii, 825	6.8	0.30	3.8	9 1.6	16 31.2	-10 14.1	+0.4697	0.4972	0.2323	+65	-18
95 Virginis	6.8	0.34	3.8	8 47.7	22 29.5	- 4 25.7	-1.1600	0.4991	0.2285	-26	-90
96 Virginis	6.9	+0.35	-4.1	- 9 49.2	23 43.1	- 3 14.2	-0.3107	0.4997	-0.2278	+25	-61
κ Virginis	4.2	0.36	4.1	9 46.1	7 1 49.2	- 1 11.6	-0.8439	0.5011	0.2265	- 6	-90
2 Libræ	6.5	0.40	4.6	11 13.1	7 27.8	+ 4 17.4	-0.5138	0.5031	0.2222	+12	-74
5 Libræ	6.6	0.50	5.9	15 0.1	19 18.9	- 8 12.0	+1.0680	0.5092	0.2119	+75	+19
μ Libræ	5.7	0.52	5.5	13 41.7	21 4.8	- 6 29.1	-0.7369	0.5109	0.2103	- 2	-90
α^1 Libræ	6.3	+0.52	-6.1	-15 32.7	21 45.8	- 5 49.4	+1.1490	0.5111	-0.2098	+74	+25
α^2 Libræ	2.9	+0.52	-6.1	-15 35.4	21 51.8	- 5 43.5	+1.1750	0.5111	-0.2095	+74	+28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ν^1 Libræ	5.5	+0.60	- 6.2	-15 50.1	8 5 56.3	+ 2 6.7	-0.2113	0.5157	-0.2005	+25	-54
ν^2 Libræ	6.9	0.61	6.3	16 3.8	6 2.0	+ 2 12.2	+0.0201	0.5159	0.2005	+36	-41
28 Libræ	6.0	0.68	6.8	17 45.9	13 5.3	+ 9 2.6	+0.4891	0.5208	0.1922	+61	-17
ζ^2 Libræ	7.0	0.74	6.6	17 4.0	17 24.7	-10 46.0	-1.0890	0.5236	0.1864	-28	-90
B. A. C. 5109	6.2	0.75	7.3	19 18.1	18 51.7	- 9 21.7	+1.0740	0.5240	0.1843	+71	+21
41 Libræ	5.9	+0.80	- 7.1	-18 56.6	21 56.5	- 6 22.6	+0.1232	0.5272	-0.1801	+39	-35
κ Libræ	5.1	0.82	7.2	19 19.6	23 25.0	- 4 57.0	+0.2766	0.5278	0.1776	+47	-27
λ Libræ	5.1	0.89	7.3	19 50.5	9 4 53.1	+ 0 20.7	-0.1155	0.5316	0.1694	+25	-48
47 Libræ	6.4	0.90	7.0	19 3.7	5 41.8	+ 1 7.8	-1.0930	0.5316	0.1680	-30	-90
ω^1 Scorpii	4.6	0.97	7.3	20 22.5	11 15.0	+ 6 30.3	-0.5844	0.5363	0.1590	0	-82
ω^2 Scorpii	4.6	+0.98	- 7.4	-20 34.5	11 31.3	+ 6 46.0	-0.4100	0.5369	-0.1585	+ 9	-68
ρ Ophiuchi *mult.*	5.0	1.11	8.0	23 11.8	19 53.0	- 9 8.9	+1.1480	0.5430	0.1433	+67	+30
18 Ophiuchi	6.7	1.27	8.0	24 27.0	10 6 43.5	+ 1 19.3	+1.0420	0.5517	0.1219	+66	+21
22 Ophiuchi	6.7	1.30	7.5	23 20.0	9 0.3	+ 3 31.2	-0.4234	0.5544	0.1172	+ 4	-70
24 Ophiuchi	6.0	1.31	7.4	22 58.7	9 52.3	+ 4 21.5	-0.9005	0.5544	0.1152	-23	-90
B. A. C. 5709	6.3	+1.34	- 8.0	-24 55.6	11 13.0	+ 5 39.3	+1.1090	0.5554	-0.1125	+65	+20
26 Ophiuchi	6.1	1.34	7.9	24 49.5	11 18.0	+ 5 44.1	+0.9040	0.5555	0.1123	+65	+11
39 Ophiuchi *mult.*	5.5	1.46	7.3	24 10.2	19 2.9	-10 47.6	-0.5936	0.5615	0.0947	- 8	-85
B. A. C. 5831	6.5	1.46	7.2	23 57.2	19 5.5	-10 45.1	-0.8268	0.5615	0.0945	-22	-90
θ Ophiuchi	3.3	1.49	7.4	24 53.6	20 44.4	- 9 9.7	+0.0177	0.5620	0.0908	+24	-41
b Ophiuchi *var.*	4.4	+1.52	- 7.0	-24 4.6	22 36.7	- 7 21.5	-1.0130	0.5642	-0.0863	-34	-90
63 Ophiuchi	6.6	1.73	6.4	24 52.0	11 10 32.0	+ 4 7.2	-1.0240	0.5716	0.0564	-38	-90
B. A. C. 6194	5.1	1.80	6.2	27 5.0	19 56.6	-10 49.6	+0.8798	0.5781	0.0292	+63	+10
λ Sagittarii	2.9	1.94	5.1	25 28.9	23 59.0	- 6 56.6	-0.8907	0.5801	0.0201	-32	-90
ϕ Sagittarii	3.7	2.07	4.6	27 6.2	12 7 1.0	- 0 11.0	+0.7189	0.5830	-0.0003	+62	- 1
σ Sagittarii	2.3	+2.11	- 3.9	-26 26.0	10 50.6	+ 3 29.5	+0.0465	0.5849	+0.0182	+18	-39
ψ Sagittarii	5.4	2.22	2.4	25 26.6	18 51.1	+11 10.9	-0.7927	0.5879	0.0339	-25	-90
B. A. C. 6666	5.8	2.35	2.1	27 12.4	13 0 25.9	- 7 27.5	+1.2583	0.5888	0.0502	+63	+51
h^1 Sagittarii *var.*	6.0	2.33	1.1	24 57.5	2 53.0	- 5 6.3	-0.9164	0.5888	0.0573	-30	-90
h^2 Sagittarii	4.6	2.32	1.0	25 7.4	3 8.5	- 4 51.5	-0.7345	0.5888	0.0583	-20	-90
ω Sagittarii	5.1	+2.45	- 0.3	-26 35.3	10 34.5	+ 2 16.6	+1.2670	0.5895	+0.0797	+63	+52
χ Capricorni	5.4	2.65	+ 5.8	21 37.8	14 15 9.6	+ 5 43.3	-0.3019	0.5868	0.1584	+13	-61
27 Capricorni	6.5	2.63	6 0	20 59.5	15 33.2	+ 6 6.0	-0.8752	0.5868	0.1592	-18	-90
ϕ Capricorni	5.5	2.65	6.3	21 6.2	17 58.1	+ 8 25.2	-0.3704	0.5854	0.1653	+10	-65
33 Capricorni	5.7	2.66	6.8	21 18.8	21 21.6	+11 40.7	+0.4129	0.5848	0.1736	+53	-20
35 Capricorni	6.2	+2.69	+ 6.9	-21 39.9	22 35.3	-11 8.6	+0.9767	0.5835	+0.1764	+68	+14
37 Capricorni	6.0	2.69	7.6	20 34.1	15 1 38.6	- 8 12.3	+0.4364	0.5825	0.1835	+55	-19
ε Capricorni	4.7	2.68	8.0	19 57.2	2 32.6	- 7 20.5	-0.0066	0.5825	0.1857	+31	-43
κ Capricorni	5.0	2.68	8.5	19 21.5	4 47.0	- 5 11.3	-0.1749	0.5826	0.1905	+23	-52
B. A. C. 7550	6.3	2.69	8.3	20 .6.9	5 0.4	- 4 58.4	+0.6170	0.5812	0.1911	+66	- 9
29 Aquarii *mult.*	6.5	+2.69	+10.0	-17 29.1	12 48.4	+ 2 31.5	-0.4260	0.5784	+0.2078	+12	-69
56 Aquarii	6.3	2.68	12.0	15 8.3	16 0 15.4	-10 27.5	-0.2308	0.5738	0.2290	+24	-56
τ^1 Aquarii *mult.*	5.8	2.68	13.1	14 37.6	7 30.4	- 3 28.8	+0.9705	0.5710	0.2407	+75	+11
τ^2 Aquarii •	4.1	2.68	13.2	14 9.9	8 17.9	- 2 43.1	+0.7074	0.5710	0.2407	+76	- 3
74 Aquarii	6.0	2.66	13.6	12 11.6	9 56.2	- 1 8.5	-0.8268	0.5703	0.2444	- 6	-90
ψ^1 Aquarii	4.1	+2.64	+14.8	- 9 40.6	19 23.8	+ 7 58.2	-0.9170	0.5658	+0.2562	-10	-90
ψ^2 Aquarii	4.2	2.64	14.5	9 46.5	20 16.3	+ 8 48.8	-0.5944	0.5658	0.2572	+ 9	-81
ψ^3 Aquarii	4.8	2.65	14.9	10 12.2	20 43.0	+ 9 14.5	-0.0619	0.5658	0.2577	+36	-46
14 Ceti	6.0	2.54	17.3	- 1 6.0	18 5 53.9	- 6 45.8	+0.0099	0.5564	0.2767	+43	-42
f Piscium	5.1	2.46	17.3	+ 3 2.7	19 0 29.6	+11 10.7	+1.0770	0.5551	0.2728	+90	+18
μ Piscium	5.0	+2.44	+17.2	+ 5 35.1	5 54.8	- 7 35.5	+0.0525	0.5552	+0.2696	+45	-38
o Piscium	4.4	2.42	16.8	8 36.9	12 35.7	- 1 8.6	-1.1440	0.5551	0.2643	-23	-81
o Arietis	6.0	2.31	14.6	14 51.3	20 14 22.1	- 0 16.9	-0.8884	0.5594	0.2345	- 6	-75
σ Arietis	5.5	2.29	14.5	14 38.2	17 21.3	+ 2 35.8	+0.0234	0.5602	0.2298	+44	-35
13 Tauri	5.7	2.17	11.9	19 21.2	21 15 0.7	- 0 31.7	-0.1625	0.5649	0.1903	+33	-41
14 Tauri	6.3	+2.16	+11.8	+19 19.4	15 37.8	+ 0 4.0	-0.0151	0.5649	+0.1890	+41	-33
B. A. C. 1143	6.0	+2.17	+11.4	+20 35.2	15 54.1	+ 0 19.7	-1.2470	0.5649	+0.1886	-38	-69

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. A. C. 1242	6.3	+2.11	+11.2	+19 53.8	21 22 55.9	+ 7 6.0	+0.7261	0.5663	+0.1735	+90	+ 8
A¹ Tauri	4.7	2.11	10.5	21 47.2	22 0 24.0	+ 8 30.8	–0.9506	0.5663	0.1702	–12	–68
A² Tauri	6.3	2.11	10.5	21 43.1	0 39.9	+ 8 46.2	–0.8364	0.5670	0.1698	– 5	–68
51 Tauri	6.0	2.06	10.0	21 19.0	6 8.8	– 9 57.0	+0.4720	0.5683	0.1573	+73	– 5
53 Tauri	6.0	2.05	10.2	20 52.9	6 35.7	– 9 31.2	+0.9863	0.5681	0 1561	+90	+25
56 Tauri	6.0	+2.06	+10.1	+21 30.8	6 39.4	– 9 27.6	+0.3487	0.5683	+0.1561	+64	–11
κ¹ Tauri	4.7	2.04	9.7	22 2.8	9 2.9	– 7 9.5	+0.1712	0.5690	0.1507	+52	–20
κ² Tauri	6.3	2.04	9.7	21 57.2	9 4.3	– 7 8.1	+0.2705	0.5690	0.1507	+59	–15
υ¹ Tauri	4.7	2.05	9.3	22 34.1	9 25.9	– 6 47.3	–0.3098	0.5688	0.1495	+25	–45
υ² Tauri	6.0	2.05	9.2	22 45.2	9 50.7	– 6 23.4	–0.4383	0.5688	0.1486	+18	–52
B. A. C. 1373	6.0	+2.02	+ 9.8	+21 22.6	10 10.0	– 6 4.8	+1.0260	0.5685	+0.1477	+90	+29
τ Tauri	4.5	1.99	8.7	22 45.1	16 4.3	– 0 23.7	+0.4424	0.5703	0.1338	+71	– 4
95 Tauri	6.3	2.00	8.3	23 53.1	16 27.4	– 0 1.4	–0.6747	0.5703	0.1327	+ 4	–65
99 Tauri	6.0	1.95	7.6	23 46.7	22 30.9	+ 5 48.5	+0.1918	0.5699	0.1176	+56	–15
k Tauri	6.0	1.98	7.4	24 53.0	22 38.0	+ 5 55.3	–0.9380	0.5698	0.1175	–13	–65
103 Tauri	6.0	+1.90	+ 7.3	+24 7.3	23 2 46.5	+ 9 54.5	+0.3154	0.5707	+0.1068	+62	– 8
118 Tauri	5.7	1.82	6.0	25 3.8	11 31.2	– 5 40.5	+0.1689	0.5706	0.0841	+53	–13
125 Tauri	6.0	1.80	5.3	25 50.3	15 49.9	– 1 31.5	–0.3024	0.5706	0.0727	+25	–37
139 Tauri	5.3	1.72	4.5	25 56.5	23 24.2	+ 5 45.8	+0.0633	0.5706	+0.0528	+46	–16
37 Geminorum	6.3	1.43	2.6	25 30.7	24 23 26.2	+ 4 54.4	+1.0320	0.5645	–0.0107	+90	+42
39 Geminorum	6.3	+1.42	+ 2.2	+26 13.4	25 0 54.4	+ 6 19.3	+0.2554	0.5645	–0.0143	+58	– 2
40 Geminorum	6.3	1.42	2.2	26 3.8	1 11.2	+ 6 35.6	+0.4215	0.5645	0.0152	+70	+ 7
47 Geminorum	6.0	1.35	1.5	27 2.1	6 15.4	+11 28.7	–0.7300	0.5620	0.0279	0	–63
Λ Geminorum	5.7	1.29	1.6	25 15.5	11 30.1	– 7 27.9	+0.9963	0.5592	0.0412	+90	+37
c Geminorum	6.0	1.20	0.6	26 2.6	20 28.4	+ 1 11.1	–0.3171	0.5551	0.0630	+24	–37
κ Geminor. *mult.*	3.6	+1.18	+ 1.1	+24 39.6	20 38.9	+ 1 21.3	+1.1690	0.5551	–0.0633	+90	+49
ω¹ Cancri	6.0	1.11	0.3	25 41.4	26 3 55.3	+ 8 22.5	–0.4684	0.5513	0.0804	+16	–48
ω² Cancri	6.3	1.11	+ 0.3	25 23.4	4 17.1	+ 8 43.4	–0.1718	0 5513	0.0811	+32	–31
ψ² Cancri	5.7	1.07	– 0.1	25 50.3	8 11.4	–11 30.3	–0.9963	0.5489	0.0897	–18	–64
λ Cancri	5.7	1.01	+ 0.1	24 21.9	12 46.5	– 7 4.7	+0.1724	0.5464	0.1000	+53	–15
υ¹ Cancri *mult.*	6.0	+0.99	– 0.3	+24 53.5	15 33.5	– 4 23.3	–0.6892	0.5449	–0.1060	+ 3	–64
υ² Cancri	5.8	0.97	0.2	24 30.3	16 27.6	– 3 31.1	–0.3636	0.5443	0.1070	+22	–45
υ³ Cancri	6.0	0.94	0.3	24 26.9	17 47.7	– 2 13.6	–0.4473	0.5433	0.1106	+17	–49
υ⁴ Cancri	5.7	0.96	0.4	24 27.3	18 28.7	– 1 34.0	–0.5309	0.5428	0.1120	+13	–55
ξ Cancri	5.0	0.78	0.8	22 29.2	27 11 35.6	– 9 0.8	–0.5861	0.5328	0.1453	+10	–61
79 Cancri	6.3	+0.78	– 0 8	+22 26.3	12 4.2	– 8 33.1	–0.6008	0.5326	–0.1460	+ 9	–62
B. A. C. 3138	6.3	0.76	0.7	21 43.9	13 39.4	– 7 1.0	–0.0605	0.5316	0.1488	+39	–32
B. A. C. 3206	6.3	0.70	0.5	20 15.5	19 5.4	– 1 45.3	+0.7285	0.5277	0.1580	+90	+ 8
η Leonis	3.3	0.51	0.8	17 17.6	28 16 26.5	– 5 3.5	+0.2804	0.5156	0.1899	+59	–20
42 Leonis	6.0	0.45	0.7	15 31.5	23 58.1	+ 2 14.8	+0.7767	0.5110	0 1990	+90	+ 6
i Leonis	5.7	+0.41	– 0.7	+14 41.8	29 5 24.4	+ 7 31.5	+0.5971	0 5088	–0.2054	+82	– 6
k Leonis	5.7	0.38	1.0	14 46.2	12 58.1	– 9 7.7	–1.0670	0.5046	0.2130	–18	–75
ν Virginis	4.0	+0.21	– 1.0	+ 7 8.4	30 21 35.3	– 1 24.9	+0.0297	0.4944	–0.2371	+44	–39

OCTOBER.

				NEW	*MOON.*						
κ Virginis	4.2	+0.19	– 3.8	– 9 46.1	4 7 43.7	+ 6 30.3	–1.0020	0.5018	–0.2288	–16	–90
2 Libræ	6.5	0.21	4.1	11 13.1	13 21.6	+11 58.6	–0.6784	0.5047	0.2247	+ 4	–90
5 Libræ	6.6	+0.25	– 5.0	–15 0.1	5 1 11.7	– 0 31.8	+0.8902	0.5099	–0.2140	+75	+ 6
μ Libræ	5.7	0.27	4.7	13 41.7	2 57.6	+ 1 11.1	–0.9212	0.5116	0.2121	–12	–90
α¹ Libræ	6.3	0.27	5.1	15 32.7	3 38.6	+ 1 50.8	+0.9654	0.5121	0.2113	+74	+11
α² Libræ	2.9	0.28	5.1	15 35.4	3 44.6	+ 1 56.7	+0.9947	0.5121	0.2113	+74	+13
ν¹ Libræ	5.5	0.32	5.3	15 50.1	11 49.2	+ 9 47.0	–0.4059	0.5169	0.2024	+15	–67
ν² Libræ	6.9	+0.32	– 5.4	–16 3.8	11 54.9	+ 9 52.5	–0.1773	0.5169	–0.2024	+26	–52
28 Libræ	6.0	+0.37	– 5.8	–17 45.9	18 58.7	– 7 16.6	+0.2878	0.5200	–0.1933	+53	–27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ζ^2 Libræ	7.0	+0.41	- 5.6	-17 4.0	**5** 23 18.8	- 3 4.4	-1.2985	0.5236	-0.1876	-49	-90
B. A. C. 5109	6.2	0.41	6.1	19 18.1	**6** 0 46.0	- 1 40.0	+0.8726	0.5246	0.1857	+71	+ 6
41 Libræ	5.9	0.45	6.2	18 56.6	3 51.3	+ 1 19.6	-0.0873	0.5265	0.1809	+28	-47
κ Libræ	5.1	0.46	6.2	19 19.6	5 20.2	+ 2 45.6	+0.0818	0.5276	0.1790	+37	-38
λ Libræ	5.1	0.51	6.3	19 50.5	10 49.9	+ 8 4.9	-0.3339	0.5313	0.1702	+15	-63
ω^1 Scorpii	4.6	+0.58	- 6.4	-20 22.5	17 14.0	- 9 43.1	-0.8084	0.5348	-0.1595	-13	-90
ω^2 Scorpii	4.6	0.58	6.5	20 34.5	17 30.4	- 9 27.3	-0.6328	0.5354	0.1590	- 3	-88
ρ Ophiuchi *mult.*	5.0	0.68	7.1	23 11.8	**7** 1 56.2	- 1 18.3	+0.5855	0.5412	0.1436	+67	+10
18 Ophiuchi	6.7	0.83	7.2	24 27.0	12 53.8	+ 9 17.0	+0.8220	0.5487	0.1219	+66	+ 5
22 Ophiuchi	6.7	0.86	6.8	23 20.0	15 12.4	+11 30.8	-0.6577	0.5499	0.1168	- 9	-90
24 Ophiuchi	6.0	+0.87	- 6.7	-22 58.7	16 4.9	-11 38.5	-1.1390	0.5508	-0.1152	-41	-90
B. A. C. 5709	6.3	0.89	7.2	24 55.6	17 26.7	-10 19.5	+0.7992	0.5521	0.1122	+65	+ 3
26 Ophiuchi	6.1	0.89	7.2	24 49.5	17 31.8	-10 14.6	+0.6810	0.5521	0.1120	+64	- 4
39 Ophiuchi *mult.*	5.5	0.97	6.7	24 10.2	**8** 1 23.8	- 2 39.2	-0.8322	0.5573	0.0945	-21	-90
B. A. C. 5831	6.5	1.00	6.7	23 57.2	1 26.4	- 2 36.7	-1.0680	0.5563	0.0939	-37	-90
θ Ophiuchi	3.3	+1.03	- 6.9	-24 53.6	3 6.9	- 0 59.8	-0.2125	0.5526	-0.0903	+11	-56
B. A. C. 6194	5.1	1.40	6.4	27 5.0	**9** 2 47.7	- 2 11.0	+0.6602	0.5702	0.0298	+58	- 5
λ Sagittarii	2.9	1.45	5.5	25 28.9	6 56.1	+ 1 48.1	-1.1330	0.5725	0.0198	-49	-90
ϕ Sagittarii	3.7	1.58	5.2	27 6.2	14 9.1	+ 8 44.7	+0.5025	0.5753	-0.0002	+44	-14
σ Sagittarii	2.3	1.63	4.6	26 26.0	18 5.2	-11 28.2	-0.1797	0.5754	+0.0106	+ 6	-53
ψ Sagittarii	5.4	+1.74	- 3.3	-25 26.6	**10** 2 19.9	- 3 32.6	-1.0280	0.5785	+0.0339	-40	-90
B. A. C. 6666	5.8	1.86	3.3	27 12.4	8 5.2	+ 1 59.5	+1.0500	0.5791	0.0500	+63	+23
h^2 Sagittarii	4.6	1.87	2.1	25 7.4	10 53.0	+ 4 40.7	-0.9636	0.5794	0.0579	-33	-90
ω Sagittarii	5.1	2.01	1.7	26 35.3	18 33.7	-11 56.4	+1.0770	0.5794	0.0792	+63	+25
A Sagittarii	5.3	2.02	- 1.5	26 29.4	19 49.8	+10 43.2	+1.0790	0.5798	0.0827	+64	+25
χ Capricorni	5.4	+2.32	+ 3.9	-21 37.8	**12** 0 8.6	- 7 29.8	-0.4872	0.5757	+0.1565	+ 4	-74
27 Capricorni	6.5	2.32	4.1	20 59.5	0 33.1	- 7 6.2	-1.0710	0.5749	0.1573	-32	-90
ϕ Capricorni	5.5	2.35	4.5	21 6.2	3 3.0	- 4 42.0	-0.5546	0.5738	0.1632	+ 1	-80
33 Capricorni	5.7	2.39	4.9	21 18.8	6 33.7	- 1 19.3	+0.2458	0.5729	0.1716	+43	-29
35 Capricorni	6.2	2.39	4.9	21 39.8	7 49.9	- 0 6.0	+0.8198	0.5729	0.1746	+68	+ 3
37 Capricorni	6.0	+2.42	+ 5.7	-20 34.0	10 59.6	+ 2 56.6	+0.2739	0.5720	+0.1818	+45	-28
ε Capricorni	4.7	2.42	6.1	19 57.1	11 55.4	+ 3 50.3	-0.1745	0.5711	0.1836	+22	-53
κ Capricorni	5.0	2.43	6.6	19 21.5	14 14.4	+ 6 4.1	-0.3423	0.5711	0.1886	+15	-63
B. A. C. 7550	6.3	2.44	6.4	20 6.9	14 28.3	+ 6 17.5	+0.4639	0.5703	0.1891	+57	-17
29 Aquarii *mult.*	6.5	2.48	8.2	17 29.1	22 31.8	- 9 57.1	-0.5843	0.5679	0.2057	+ 4	-82
56 Aquarii	6.3	+2.54	+10.5	-15 8.3	**13** 10 20.3	+ 1 25.5	-0.3654	0.5653	+0.2274	+17	-64
τ^1 Aquarii *mult.*	5.8	2.59	11.6	14 37.6	17 47.8	+ 8 36.7	+0.8662	0.5619	0.2389	+75	+ 4
τ^2 Aquarii	4.1	2.59	11.8	14 9.9	18 36.7	+ 9 23.8	+0.6017	0.5619	0.2402	+72	-11
74 Aquarii	6.0	2.58	12.4	12 11.6	20 17.7	+11 1.2	-0.9453	0.5618	0.2428	-13	-90
ψ^1 Aquarii	4.1	2.61	13.9	9 40.6	**14** 5 59.4	- 3 38.0	-1.0160	0.5584	0.2549	-16	-90
ψ^2 Aquarii	4.2	+2.61	+14.0	- 9 46.5	6 53.0	- 2 46.4	-0.6923	0.5584	+0.2561	+ 4	-90
ψ^3 Aquarii	4.8	2.62	14.0	10 12.2	7 20.5	- 2 19.8	-0.1516	0.5585	0.2565	+32	-51
B. A. C. 8274	7.0	2.65	15.7	6 58.9	20 17.7	+10 9.9	+0.0836	0.5564	0.2688	+46	-38
14 Ceti	6.0	2.70	17.7	1 6.0	**15** 17 1.0	+ 6 9.5	-0.0016	0.5546	0.2781	+42	-43
15 Ceti	6.8	2.70	17.8	- 1 6.0	18 8.6	+ 7 14.8	+0.3105	0.5546	0.2782	+60	-26
f Piscium	5.1	+2.73	+18.4	+ 3 2.7	**16** 11 38.7	+ 0 8.1	+1.1060	0.5560	+0.2753	+90	+20
μ Piscium	5.0	2.74	18.5	5 35.1	17 2.6	+ 5 20.6	+0.0966	0.5578	0.2731	+48	-36
o Piscium	4.4	2.77	18.5	8 36.9	23 40.5	+11 44.5	-1.0830	0.5582	0.2681	-18	-81
σ Arietis	5.5	2.82	16.7	14 38.2	**18** 3 58.9	- 8 58.4	+0.1372	0.5667	0.2342	+50	-30
13 Tauri	5.7	2.84	14.1	19 21.3	**19** 1 5.6	+11 21.3	-0.0184	0.5732	0.1945	+41	-33
14 Tauri	6.3	+2.83	+14.2	+19 19.5	1 41.5	+11 55.8	+0.1271	0.5738	+0.1935	+50	-25
B. A. C. 1143	6.0	2.82	13.8	20 35.3	1 57.3	-11 49.0	-1.0900	0.5738	0.1930	-22	-69
B. A. C. 1242	6.3	2.82	13.2	19 53.8	8 46.5	- 5 15.4	+0.8708	0.5758	0.1777	+90	+16
A^1 Tauri	4.7	2.85	12.7	21 47.2	10 12.3	- 3 52.8	-0.7818	0.5758	0.1740	- 1	-68
A^2 Tauri	6.3	2.84	12.6	21 43.1	10 27.7	- 3 38.0	-0.6688	0.5767	0.1738	+ 6	-67
51 Tauri	6.0	+2.81	+12.0	+21 19.0	15 46.4	+ 1 28.6	+0.6272	0.5778	+0.1611	+88	+ 4
56 Tauri	6.0	+2.81	+11.9	+21 30.8	16 16.2	+ 1 57.2	+0.5075	0.5778	+0.1599	+76	- 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
κ¹ Tauri	4.7	+2.80	+11.5	+22 2.8	19 18 35.2	+ 4 10.9	+0.3294	0.5784	+0.1544	+63	−11
κ² Tauri	6.3	2.80	11.5	21 57.2	18 36.8	+ 4 12.5	+0.4290	0.5784	0.1542	+70	− 6
υ¹ Tauri	4.7	2.81	11.3	22 34.1	18 57.4	+ 4 32.2	−0.1402	0.5784	0.1534	+35	−35
υ² Tauri	6.0	2.82	11.2	22 45.2	19 21.3	+ 4 55.2	−0.2685	0.5784	0.1524	+28	−42
τ Tauri	4.5	2.79	10.4	22 45.1	20 1 23.1	+10 43.1	+0.6067	0.5798	0.1368	+86	+ 5
95 Tauri	6.3	+2.80	+10.0	+23 53.1	1 45.4	+11 4.6	−0.4958	0.5805	+0.1360	+15	−54
99 Tauri	6.0	2.77	9.2	23 46.8	7 37.1	− 7 17.4	+0.3646	0.5805	0.1203	+65	− 7
k Tauri	6.0	2.77	8.9	24 53.1	7 44.1	− 7 10.7	−0.7513	0.5805	0.1201	0	−65
103 Tauri	6.0	2.74	8.5	24 7.3	11 44.5	− 3 19.6	+0.4889	0.5808	0.1094	+75	+ 1
118 Tauri	5.7	2.69	6.9	25 3.8	20 12.1	+ 4 48.3	+0.3522	0.5808	0.0863	+65	− 4
125 Tauri	6.0	+2.69	+ 5.9	+25 50.3	21 0 22.5	+ 8 49.0	−0.1120	0.5809	+0.0745	+36	−27
139 Tauri	5.3	2.61	4.7	25 56.5	7 42.4	− 8 8.1	+0.2530	0.5800	+0.0542	+58	− 6
39 Geminorum	6.3	2.36	1.4	26 13.4	22 8 27.9	− 8 19.5	+0.4455	0.5707	−0.0146	+72	+ 8
40 Geminorum	6.3	2.35	1.4	26 3.8	8 44.4	− 8 3.6	+0.6109	0.5705	0.0155	+88	+16
47 Geminorum	6.0	2.31	+ 0.1	27 2.1	13 40.6	− 3 18.4	−0.5247	0.5685	0.0284	+13	−47
A Geminorum	5.7	+2.23	− 0.1	+25 15.5	18 47.4	+ 1 37.0	+1.1845	0.5658	−0.0418	+90	+52
υ Geminorum	4.3	2.19	1.4	27 8.2	23 0 1.7	+ 6 39.8	−1.0730	0.5628	0.0552	−25	−63
c Geminorum	6.0	2.12	1.6	26 2.6	3 33.4	+10 3.8	−0.1159	0.5608	0.0640	+36	−26
ω¹ Cancri	6.0	2.02	2.4	25 41.4	10 51.0	− 6 54.2	−0.2683	0.5558	0.0814	+27	−36
ω² Cancri	6 3	2.01	2.4	25 23.4	11 12.5	− 6 33.6	+0.0233	0.5552	0.0821	+44	−21
ψ¹ Cancri	6.8	+1.98	− 3.1	+26 9.9	14 55.5	− 2 58.4	−1.1330	0.5534	−0.0908	−30	−64
ψ² Cancri	5.7	1.98	3.1	25 50.3	15 2.3	− 2 51.9	−0.7900	0.5531	0.0910	− 3	−64
λ Cancri	5.7	1.89	3.0	24 21.9	19 32.7	+ 1 29.1	+0.3633	0.5494	0.1011	+65	− 5
υ¹ Cancri *mult.*	6.0	1.87	3.5	24 53.5	22 17.1	+ 4 7.8	−0.4900	0.5482	0.1082	+15	−52
υ² Cancri	5.8	1.85	3.5	24 30.3	23 10.2	+ 4 59.1	−0.1675	0.5473	0.1090	+33	−33
υ³ Cancri	6.0	+1.83	− 3.6	+24 26.9	24 0 28.9	+ 6 15.1	−0.2500	0.5466	−0.1117	+28	−38
υ⁴ Cancri	5.7	1.82	3.7	24 27.3	1 9.4	+ 6 54.2	−0.3357	0.5462	0.1131	+24	−43
ξ Cancri	5.0	1.59	4.6	22 29.2	18 3.4	− 0 45.5	−0.3982	0.5340	0.1460	+21	−51
79 Cancri	6.3	1.58	4.6	22 26.3	18 31.7	− 0 18.1	−0.4146	0.5334	0.1469	+20	−52
B. A. C. 3138	6.3	1.55	4.5	21 43.9	20 6.0	+ 1 13.1	+0.1237	0.5320	0.1496	+50	−23
B. A. C. 3206	6.3	+1.48	− 4.4	+20 15.5	25 1 29.0	+ 6 25.8	+0.9034	0.5277	−0.1589	+90	+18
η Leonis	3.3	1.21	5.0	17 17.5	22 43.1	+ 3 0.6	+0.4460	0.5138	0.1901	+70	−11
42 Leonis	6.0	1.11	4.9	15 31.4	26 6 13.7	+10 17.8	+0.9303	0.5097	0.1995	+90	+15
i Leonis	5.7	1.04	5.0	14 41.7	11 39.6	− 8 25.8	+0.7479	0.5071	0.2058	+90	+ 3
k Leonis	5.7	0.99	5.3	14 46.1	19 13.1	− 1 5.2	−0.9189	0.5033	0.2135	− 8	−75
ω Virginis	5.9	+0.71	− 4.9	+ 8 44.2	27 23 44.5	+ 2 38.7	−0.6612	0.4935	−0.2354	+ 8	−80
ν Virginis	4.0	0.65	4.7	7 8.3	28 3 53.1	+ 6 40.4	+0.1352	0.4923	0.2376	+50	−34
c Virginis	5.5	0.54	4.8	+ 3 55.1	23 21.4	+ 1 37.4	−0.9891	0.4904	0.2447	−11	−86
46 Virginis	6.1	0.42	4.5	− 2 47.0	29 22 5.5	− 0 15.0	+0.8541	0.4913	0.2465	+87	+ 3
48 Virginis	6.7	+0.41	− 4.5	− 3 4.7	23 57.2	+ 1 33.8	+0.7228	0.4918	−0.2465	+86	− 5
				NEW	*MOON.*						

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
Venus				−18 2.0	2 2 23.6	+ 1 53.0	+0.2314	0.4711	−0.1776	+47	−30
ω¹ Scorpii	4.6	+0.44	− 5.9	20 22.5	22 57.6	− 2 12.3	−0.8614	0.5230	0.1569	−16	−90
ω² Scorpii	4.6	0.44	5.9	20 34.5	23 14.1	− 1 56.4	−0.6929	0.5234	0.1565	− 6	−90
ρ Ophiuchi *mult.*	5.0	0.50	6.2	23 11.8	3 7 35.7	+ 6 8.6	+0.8164	0.5287	0.1410	+67	+ 4
18 Ophiuchi	6.7	0.59	6.3	24 27.0	18 28.8	− 7 20.6	+0.7073	0.5352	0.1197	+65	− 3
22 Ophiuchi	6.7	+0.61	− 6.1	−25 20.0	20 46.5	− 5 7.7	−0.7286	0.5362	−0.1147	−13	−90
B. A. C. 5709	6.3	0.63	6.4	24 55.6	23 0.3	− 2 58.6	+0.6833	0.5380	0.1147	+64	− 4
26 Ophiuchi	6.1	0.63	6.4	24 49.5	23 5.3	− 2 53.8	+0.5688	0.5380	0.1099	+57	−11
39 Ophiuchi *mult.*	5.5	0.71	6.1	24 10.2	4 6 55.2	+ 4 39.5	−0.9097	0.5432	0.0927	−26	−90
B. A. C. 5831	6.5	0.71	6.1	23 57.2	6 57.8	+ 4 42.0	−1.1390	0.5432	0.0925	−43	−90
θ Ophiuchi	3.3	+0.73	− 6.2	−24 53.6	8 38.0	+ 6 18.7	−0.3102	0.5434	−0.0886	+ 7	−62
B. A. C. 6194	5.1	+1.01	− 6.0	−27 5.0	5 8 18.8	+ 5 7.5	+0.5370	0.5547	−0.0290	+48	−12

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
λ Sagittarii	2.9	+1.06	− 5.3	−25 28.9	5 12 28.1	+ 9 7.5	−1.2180	0.5563	−0.0196	−57	−90
φ Sagittarii	3.7	1.17	5.1	27 6.2	19 43.8	− 7 53.2	+0.3790	0.5585	−0.0003	+35	−21
σ Sagittarii	2.3	1.22	4.7	26 26.0	23 41.8	− 4 4.3	−0.2894	0.5593	+0.0103	0	−61
τ Sagittarii	3.6	1.30	5.3	27 49.7	6 4 27.7	+ 0 30.8	+1.2260	0.5610	0.0231	+62	+44
ψ Sagittarii	5.4	1.32	3.7	25 26.7	8 1.6	+ 3 56.5	−1.1260	0.5614	0.0326	−48	−90
B. A. C. 6666	5.8	+1.42	− 3.8	−27 12.5	13 51.4	+ 9 33.1	+0.9179	0.5616	+0.0484	+63	+12
h^2 Sagittarii	4.6	1.44	2.8	25 7.4	16 41.7	−11 43.2	−1.0680	0.5623	0.0560	−41	−90
ω Sagittarii	5.1	1.58	2 6	26 35.3	7 0 29.9	− 4 12.8	+0.9506	0.5626	0.0766	+63	+14
A Sagittarii	5.3	1.59	− 2.5	26 29.4	1 47.3	− 2 58.3	+0.9506	0.5620	0.0801	+64	+14
χ Capricorni	5.4	1.91	+ 2.2	21 37.8	8 6 47.2	+ 0 56.4	−0.6030	0.5582	0.1521	− 3	−85
27 Capricorni	6.5	+1.89	+ 2.4	−20 59.5	7 12.4	+ 1 20.6	−1.1860	0.5578	+0.1529	−41	−90
φ Capricorni	5.5	1.93	2.7	21 6.2	9 46.8	+ 3 49.4	−0.6705	0.5577	0.1590	− 6	−90
33 Capricorni	5.7	1.97	3.0	21 18.8	13 23.9	+ 7 18.5	+0.1335	0.5569	0.1671	+37	−35
35 Capricorni	6.2	2.00	3.0	21 39.9	14 42.5	+ 8 34.2	+0.7082	0.5562	0.1698	+68	− 3
37 Capricorni	6.0	2.02	3.8	20 34.1	17 58.2	+11 42.8	+0.1653	0.5556	0.1769	+40	−33
κ Capricorni	5.0	+2.05	+ 4.7	−19 21.6	21 19.4	− 9 3.3	−0.4536	0.5555	+0.1840	+ 9	−71
B. A. C. 7550	6.3	2.06	4.5	20 7.0	21 33.7	− 8 49.5	+0.3575	0.5554	0.1847	+52	−23
29 Aquarii *mult.*	6.5	2.13	6.3	17 29.2	9 5 53.8	− 0 47.4	−0.6952	0.5530	0.2008	− 2	−90
53 Aquarii *mult.*	5.8	2.23	7.5	17 17.6	16 27.9	+ 9 24.2	+1.3330	0.5513	0.2197	+73	+48
56 Aquarii	6.3	2.23	8.4	15 8.3	18 7.9	+11 0.7	−0.4706	0.5511	0.2223	+12	−72
τ^1 Aquarii *mult.*	5.8	+2.29	+ 9.4	−14 37.6	10 1 52.3	− 5 31.0	+0.7802	0.5493	+0.2342	+69	− 1
τ^2 Aquarii	4 1	2.30	9.6	14 9.9	2 43.0	− 4 42.1	+0.5135	0.5491	0.2356	+66	−16
74 Aquarii	6.0	2.29	10.4	12 11.6	4 27.7	− 3 1.0	−1.0570	0.5489	0.2381	−20	−90
ψ^1 Aquarii	4.1	2.37	12.0	9 40.6	14 31.5	+ 6 42.1	−1.1270	0.5488	0.2514	−24	−90
ψ^2 Aquarii	4.2	2.38	12.1	9 46.5	15 27.2	+ 7 35.8	−0.7936	0.5488	0.2525	− 2	−90
ψ^3 Aquarii	4.8	+2.38	+12.0	−10 12.2	15 55.7	+ 8 3.3	−0.2416	0.5485	+0.2530	+27	−56
B. A. C. 8274	7.0	2.49	14.0	6 59.0	11 5 21.9	− 2 57.9	+0.0102	0.5494	0.2651	+41	−42
14 Ceti	6.0	2.64	16.7	1 6.0	12 2 48.2	− 6 15.2	−0.0555	0.5530	0.2784	+40	−46
15 Ceti	6.8	2.65	16.8	− 1 6.0	3 57.8	− 5 7.9	+0.2672	0.5533	0.2785	+58	−29
f Piscium	5.1	2.78	17.9	+ 3 2.7	21 57.4	−11 45.1	+1.1080	0.5602	0.2785	+90	+20
96 Piscium	6.6	+2.82	+18.5	+ 6 44.1	13 2 59.1	− 6 53.7	−1.2330	0.5618	+0.2764	−29	−83
μ Piscium	5.0	2.83	18.4	5 35.1	3 28.9	− 6 25.0	+0.0691	0.5622	0.2761	+47	−38
o Piscium	4.4	2.89	18.7	8 36.9	10 15.1	+ 0 7.3	−1.1420	0.5650	0.2725	−22	−81
o Arietis	6.0	3.11	17.9	14 51.3	14 11 57.4	+ 0 54.9	−0.7937	0.5800	0.2458	0	−75
σ Arietis	5.5	3.13	17.6	14 38.2	14 54.3	+ 3 45.3	+0.1468	0.5820	0.2415	+51	−29
13 Tauri	5.7	+3.30	+15.5	+19 21.3	15 12 1.2	+ 0 5.1	+0.0069	0.5951	+0.2028	+43	−32
A^1 Tauri	4.7	3.37	14.2	21 47.2	21 3.9	+ 8 47.0	−0.7750	0.5991	0.1820	− 1	−68
A^2 Tauri	6.3	3.37	14.1	21 43.1	21 19.3	+ 9 1.9	−0.6574	0.5991	0.1814	+ 6	−67
κ^1 Tauri	4.7	3.39	12.8	22 2.8	16 5 21.2	− 7 14.9	+0.3791	0.6034	0.1614	+66	− 9
κ^2 Tauri	6.3	3.39	12.8	21 57.2	5 22.5	− 7 13.6	+0.4800	0.6034	0.1614	+74	− 4
υ^1 Tauri	4.7	+3.40	+12.7	+22 34.1	5 43.2	− 6 53.8	−0.1061	0.6034	+0.1605	+37	−33
υ^2 Tauri	6.0	3.41	12.6	22 45.2	6 6.8	− 6 31.1	−0.2365	0.6036	0.1595	+29	−41
τ Tauri	4.5	3.41	11.4	22 45.1	12 3.4	− 0 48.4	+0.6666	0.6056	0.1436	+90	+ 8
95 Tauri	6.3	3.44	11.2	23 53.1	12 25.4	− 0 27.4	−0.4695	0.6060	0.1428	+17	−53
99 Tauri	6.0	3.43	10.2	23 46.8	18 11.2	+ 5 4.9	+0.4160	0.6060	0.1264	+72	− 4
k Tauri	6.0	+3.46	+10.0	+24 53.1	18 18.1	+ 5 11.5	−0.7285	0.6070	+0.1263	+ 1	−65
103 Tauri	6.0	3 43	9.3	24 7.4	22 14.0	+ 8 58.1	+0.5457	0.6075	0.1149	+80	+ 4
118 Tauri	5.7	3.44	7.6	25 3.8	17 6 31.4	− 7 4.3	+0.4102	0.6075	0.0907	+69	− 1
125 Tauri	6.0	3.47	6.5	25 50.3	10 36.3	− 3 9.1	−0.0636	0.6082	0.0787	+39	−24
139 Tauri	5.3	3.43	+ 5.0	25 56.5	17 45.9	+ 3 43.5	+0.3139	0.6075	+0.0571	+62	− 3
39 Geminorum	6.3	+3.25	0.0	+26 13.5	18 17 53.4	+ 2 54.0	+0.5152	0.5978	−0.0151	+78	+11
40 Geminorum	6.3	3.25	− 0.1	26 3.9	18 9.3	+ 3 9.4	+0.6821	0.5976	0.0158	+90	+20
47 Geminorum	6.0	3.22	1.3	27 2.1	22 57.6	+ 7 46.6	−0.4730	0.5939	0.0297	+16	−44
υ Geminorum	4.3	3.13	3.4	27 8.2	19 9 2.3	− 6 31.7	−1.0260	0.5861	0.0573	−21	−63
c Geminorum	6.0	3.05	3.3	26 2.6	12 28.5	− 3 13.2	−0.0524	0.5835	0.0658	+39	−23
ω^1 Cancri	6.0	+2.96	− 4.8	+25 41.4	19 34.8	+ 3 37.5	−0.2086	0.5780	−0.0845	+31	−33
ω^2 Cancri	6.3	+2.96	− 4.8	+25 23.4	19 55.8	+ 3 57.6	+0.0889	0.5776	−0.0855	+48	−17

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
ψ^1 Cancri	6.8	+2.94	- 5.5	+26 9.9	19 23 33.3	+ 7 27.3	-1.0820	0.5745	-0.0944	-25	-64
ψ^2 Cancri	5.7	2.92	5.6	25 50.3	23 39.9	+ 7 33.6	-0.7363	0.5742	0.0957	+ 1	-63
λ Cancri	5.7	2.84	5.9	24 21.9	20 4 3.5	+11 47.7	+0.4335	0.5703	0.1051	+71	- 1
ν^1 Cancri *mult.*	6.0	2.82	6.5	24 53.5	6 44.0	- 7 37.4	-0.4317	0.5675	0.1112	+18	-48
ν^2 Cancri	5.8	2.80	6.5	24 30.3	7 35.8	- 8 47.5	-0.1039	0.5661	0.1130	+37	-30
ν^3 Cancri	6.0	+2.78	- 6.7	+24 26.9	8 52.8	- 7 33.2	-0.1898	0.5658	-0.1159	+32	-35
ν^4 Cancri	5.7	2.78	6.9	24 27.3	9 32.3	- 6 55.1	-0.2737	0.5652	0.1174	+27	-39
ξ Cancri	5.0	2.53	8.8	22 29.1	21 2 4.3	+ 9 3.2	-0.3333	0.5488	0.1504	+24	-46
79 Cancri	6.3	2.52	8.8	22 26.2	2 32.0	+ 9 29.9	-0.3524	0.5489	0.1515	+23	-48
B. A. C. 3138	6.3	2.49	8.7	21 43.8	4 4.5	+10 59.4	+0.1909	0.5474	0.1542	+54	-19
B. A. C. 3206	6.3	+2.40	- 8.8	+20 15.4	9 21.4	- 7 54.0	+0.9743	0.5409	-0.1629	+90	+23
η Leonis	3.3	2.08	10.0	17 17.5	22 6 15.9	-11 38.9	+0.5065	0.5219	0.1936	+75	- 8
42 Leonis	6.0	1.98	10.1	15 31.4	13 41.1	- 4 27.1	+0.9926	0.5172	0.2026	+90	+19
i Leonis	5.7	1.91	10 3	14 41.6	19 3.7	+ 0 46.0	+0.8063	0.5125	0.2083	+90	+ 6
k Leonis	5.7	1.82	10.8	14 46.0	23 2 33.5	+ 8 2.8	-0.8636	0.5072	0.2156	- 4	-75
ω Virginis	5.9	+1.47	-10.4	+ 8 44.1	24 6 57.6	+11 39.4	-0.6085	0.4903	-0.2344	+11	-77
ν Virginis	4.0	1.43	10.1	7 8.2	11 5.8	- 8 19.2	+0.1802	0.4892	0.2365	+53	-32
c Virginis	5.5	1.23	9.9	+ 3 55.0	25 6 34.7	+10 38.4	-0.9397	0.4841	0.2422	- 8	-86
46 Virginis	6.1	1.02	8.7	- 2 47.0	26 5 21.1	+ 8 48.3	+0.8694	0.4816	0.2420	+87	+ 3
48 Virginis	6.7	1.01	8.6	3 4.7	7 13.1	+10 37.3	+0.7369	0.4820	0.2417	+84	- 4
65 Virginis	6.1	+0.93	- 8.5	- 4 21.4	18 6.1	- 2 47.3	-0.4900	0.4839	-0.2394	+17	-72
66 Virginis	6.0	0.93	8.5	4 35.7	18 47.0	- 2 7.5	-0.3971	0.4832	0.2388	+22	-66
l^1 Virginis	5.1	0.90	8.6	5 41.7	22 54.8	+ 1 53.6	-0.1910	0.4839	0.2378	+32	-53
m Virginis	5.4	0.86	7.1	8 9.2	27 4 13.5	+ 7 3.6	+1.2090	0.4853	0.2352	+82	+28
B. A C. 4647 *mult.*	6.4	0.82	8.0	7 31.4	11 33.2	- 9 48.6	-1.1790	0.4875	0.2314	-27	-90
W. xiii, 825	6.8	+0.82	- 7.6	- 9 1.6	11 58.8	- 9 24.0	+0.3386	0.4876	-0.2312	+59	-25
95 Virginis	6.0	0.80	7.7	8 47.7	17 54.0	- 3 38.7	-1.2700	0.4902	0.2277	-36	-90
96 Virginis	6.9	0.79	7.5	9 49.2	19 6.8	- 2 28.0	-0.4436	0.4909	0.2272	+17	-69
κ Virginis	4.2	0.78	7.6	9 46.1	21 11.7	- 0 26.7	-0.9698	0.4913	0.2255	-13	-90
2 Libræ	6.5	0.75	7.4	11 13.1	28 2 46.6	+ 4 58.7	-0.6637	0.4932	0.2211	+ 5	-88
μ Libræ	5.7	+0.71	- 7.1	-13 41.7	16 13.2	- 5 58.2	-0.9168	0.5010	-0.2090	-12	-90
α^1 Libræ	6.3	0.71	6.8	15 32.7	16 53.7	- 5 19.0	+0.9061	0.5013	0.2084	+74	+ 7
α^2 Libræ	2.9	0.71	6.8	15 35.4	16 59.5	- 5 13.3	+0.9345	0.5013	0.2084	+74	+ 9
ν^1 Libræ	5.5	+0.69	- 6.8	-15 50.1	29 0 57.1	+ 2 29.9	-0.4320	0.5063	-0.1996	+13	-69
				NEW	*MOON.*						

DECEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
Mercury				-25 50.5	2 8 31.7	+ 7 21.0	-0.5247	0.5154	-0.0472	- 9	-79
B. A. C. 6194	5.1	+0.94	- 5.1	-27 5.0	14 19.1	-11 4.7	+0.5778	0.5937	-0.0324	+52	-10
λ Sagittarii	2.9	0.96	4.7	25 28.9	18 24.5	- 7 8.7	-1.2700	0.5944	0.0208	-64	-90
φ Sagittarii	3.7	1.03	4.5	27 6.2	3 1 33.8	- 0 15.8	+0.4133	0.5966	-0.0004	+38	-18
σ Sagittarii	2.3	1.06	4.1	26 26.0	5 28.5	+ 3 29.8	-0.2900	0.5969	+0.0112	0	-61
ψ Sagittarii	5.4	1.12	3.4	25 26.6	13 41.7	+11 24.0	-1.1690	0.5980	0.0349	-51	-90
B. A. C. 6666	5.8	+1.19	- 3.4	-27 12.4	19 27.2	- 7 3.8	+0.9838	0.5978	+0.0518	+63	+17
h^2 Sagittarii	4.6	1.20	2.7	25 7.4	22 15.8	- 4 21.8	-1.1040	0.5970	0.0596	-44	-90
ω Sagittarii	5.1	1.30	2.5	26 35.3	4 5 59 6	+ 3 4.3	+1.0140	0.5953	0.0814	+63	+20
A Sagittarii	5.3	1.31	- 2.4	26 29.4	7 16.4	+ 4 18.2	+1.0180	0.5946	0.0849	+64	+20
ι Capricorni	5.4	1 57	+ 1.3	21 37.9	5 12 10.3	+ 8 6.8	-0.6042	0.5826	0.1590	- 3	-85
27 Capricorni	6.5	+1.56	+ 1.4	-20 59.6	12 35.7	+ 8 31.3	-1.2130	0.5826	+0.1601	-44	-90
ο Capricorni	5.5	1.59	1.8	21 6.3	15 10.4	+11 0.3	-0.6736	0.5804	0.1658	- 6	-90
33 Capricorni	5.7	1.64	2.0	21 18.9	18 48.4	- 9 29.7	+0.1655	0.5781	0.1738	+38	-33
35 Capricorni	6.2	1.66	2.0	21 40.0	20 7.4	- 8 13.6	+0.7676	0.5776	0.1766	+68	0
37 Capricorni	6.0	1.68	2.6	20 34.2	23 24.2	- 5 3.9	+0.2004	0.5754	0.1834	+41	-32
ε Capricorni	4.7	+1.70	+ 3.1	-19 57.2	6 0 22.2	- 4 8.0	-0.2707	0.5754	+0.1855	+17	-59
κ Capricorni	5.0	+1.72	+ 3.4	-19 21.6	2 46.9	- 1 48.5	-0.4422	0.5731	+0.1902	+ 9	-70

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. A. C. 7550	6.3	+1.73	+ 3.1	−20 7.0	**6** 3 1.4	− 1 34.4	+0.4018	0.5731	+0.1905	+53	−21
29 Aquarii *mult.*	6.5	1.80	4.8	17 29.2	11 26.4	+ 6 32.5	−0.6904	0.5678	0.2065	− 3	−90
56 Aquarii	6.3	1.90	6.6	15 8.4	23 50.8	− 5 28.9	−0.4521	0.5609	0.2266	+13	−70
τ^1 Aquarii *mult.*	5.8	1.98	7.5	14 37.7	**7** 7 43.5	+ 2 7.6	+0.8424	0.5565	0.2375	+75	+ 3
τ^2 Aquarii	4.1	1.98	7.7	14 10.0	8 35.3	+ 2 57.6	+0.5685	0.5563	0.2387	+70	−13
74 Aquarii	6.0	+1.98	+ 8.5	−12 11.7	10 22.2	+ 4 40.7	−1.0560	0.5552	+0.2410	−20	−90
ψ^1 Aquarii	4.1	2.07	10.1	9 40.6	20 39.6	− 9 22.5	−1.1220	0.5504	0.2522	−23	−90
ψ^2 Aquarii	4.2	2.08	10.2	9 46.5	21 36.7	− 8 27.3	−0.7793	0.5503	0.2533	− 1	−90
ψ^3 Aquarii	4.8	2.09	10.0	10 12.2	22 5.8	− 7 59.2	−0.2134	0.5493	0.2533	+29	−55
B. A. C. 8274	7.0	2.23	12.1	6 59.0	**8** 11 54.0	+ 5 21.7	+0.0462	0.5448	0.2641	+44	−40
14 Ceti	6.0	+2.43	+14.9	− 1 6.1	**9** 10 0.8	+ 2 45.0	−0.0220	0.5396	+0.2714	+41	−44
15 Ceti	6.8	2.44	15.0	− 1 6,1	11 13.0	+ 3 54.9	+0.3068	0.5396	0.2717	+60	−26
f Piscium	5.1	2.65	16.5	+ 3 2.6	**10** 5 49.7	− 2 5.0	+1.1380	0.5394	0.2679	+90	+22
96 Piscium	6.6	2.71	17.5	6 44.0	11 1.8	+ 2 56.7	−1.1930	0.5405	0.2657	−26	−83
μ Piscium	5.0	2.71	17.2	5 35.1	11 32.7	+ 3 26 6	+0.0990	0.5407	0.2654	+48	−36
o Piscium	4.4	+2.81	+18.0	+ 8 36.9	18 32.8	+10 12.8	−1.1040	0.5413	+0.2605	−19	−81
o Arietis	6.0	3.16	18.1	14 51.3	**11** 21 4.4	+11 49.8	−0.7546	0.5485	0.2322	+ 2	−73
σ Arietis	5.5	3.20	17.8	14 38.2	**12** 0 6.2	− 9 14.9	+0.1609	0.5503	0.2278	+52	−29
53 Arietis	6.3	3.31	17.7	17 27.8	6 58.2	− 2 37.5	−1.1205	0.5531	0 2171	−23	−73
13 Tauri	5.7	3.50	16.0	19 21.3	21 43.5	+11 35.5	+0.0115	0.5589	0.1899	+43	−32
14 Tauri	6.3	+3.50	+15.9	+19 19.5	22 20.0	−11 49.4	+0.1553	0.5594	+0.1888	+52	−24
B. A. C. 1143	6.0	3.53	16.1	20 35.3	22 36.1	−11 33.9	−1.0460	0.5593	0.1882	−19	−69
A^1 Tauri	4.7	3.64	14.9	21 47.2	**13** 6 56.4	− 3 32.4	−0.7403	0.5626	0.1704	+ 2	−68
A^2 Tauri	6.3	3.64	14.8	21 43.1	7 11.9	− 3 17.5	−0.6296	0.5628	0.1698	+ 8	−65
51 Tauri	6.0	3.67	13.8	21 19.0	12 32.2	+ 1 50.7	+0.6428	0.5649	0.1575	+89	+ 5
53 Tauri	6.0	+3.67	+13.7	+20 52.9	12 58.4	+ 2 15.9	+1.1460	0.5650	+0.1565	+90	+37
56 Tauri	6.0	3.68	13.8	21 30.8	13 2.0	+ 2 19.3	+0.5271	0.5650	0.1563	+78	− 2
κ^1 Tauri	4.7	3.71	13.4	22 2.8	15 21.2	+ 4 33.2	+0.3553	0.5657	0.1509	+64	−10
κ^2 Tauri	6.3	3.71	13.4	21 57.2	15 22.5	+ 4 34.5	+0.4511	0.5657	0.1509	+72	− 6
υ^1 Tauri	4.7	3.73	13.4	22 34.1	15 43.4	+ 4 54.6	−0.1074	0.5658	0.1499	+37	−33
υ^2 Tauri	6.0	+3.73	+13.3	+22 45.2	16 7.3	+ 5 17.7	−0.2314	0.5663	+0.1489	+30	−40
τ Tauri	4.5	3.79	12.1	22 45.1	22 8.1	+11 4.4	+0.6230	0.5676	0.1341	+88	+ 6
118 Tauri	5.7	3.95	8.2	25 3.8	**14** 16 43.5	+ 4 55.9	+0.3681	0.5710	0.0844	+66	− 3
139 Tauri	5.3	4.02	+ 5.4	25 56.5	**15** 3 58.6	− 8 15.7	+0.2678	0.5712	0.0528	+59	− 5
47 Geminorum	6.0	4.01	− 1.9	27 2.1	**16** 8 58.6	− 4 24.3	−0.4813	0.5627	+0.0288	+15	−45
A Geminorum	5.7	+3.93	− 2.9	+25 15.5	13 54.0	+ 0 19.7	+1.1350	0.5595	−0.0418	+90	+48
υ Geminorum	4.3	3.96	4.4	27 8.1	18 56.0	+ 5 10.1	−1.0120	0.5575	0.0551	−20	−63
c Geminorum	6.0	3.89	5.3	26 2.5	22 19.5	+ 8 25.9	−0.1051	0.5552	0.0641	+36	−25
ω^1 Cancri	6.0	3.84	6 7	25 41.3	**17** 5 19.5	− 8 49.8	−0.2542	0.5521	0.0815	+28	−35
ω^2 Cancri	6.3	3.83	6.7	25 23.3	5 40.0	− 8 30.0	+0.0238	0.5507	0.0821	+44	−21
ψ^1 Cancri	6.8	+3.82	− 7.7	+26 9.8	9 14.0	− 5 4.0	−1.0750	0.5469	−0.0904	−24	−64
ψ^2 Cancri	5.7	3.81	7.6	25 50.2	9 20.6	− 4 57.7	−0.7525	0.5468	0.0910	− 1	−64
λ Cancri	5.7	3.73	8.3	24 21.8	13 40.1	− 0 47.6	+0.3419	0.5445	0.1009	+64	− 7
υ^1 Cancri *mult.*	6.0	3.72	8.9	24 53.4	16 17.8	+ 1 44.4	−0.4735	0.5434	0.1069	+16	−51
υ^2 Cancri	5.8	3.70	9.1	24 30.2	17 8.8	+ 2 33.5	−0.1663	0.5428	0.1088	+33	−33
υ^3 Cancri	6.0	+3.69	− 9.3	+24 26.8	18 24.4	+ 3 46.4	−0.2470	0.5413	−0.1115	+29	−38
υ^4 Cancri	5.7	3.69	9.5	24 27.2	19 3.2	+ 4 23.9	−0.3276	0.5407	0.1127	+24	−43
ξ Cancri	5.0	3.46	12.2	22 29.1	**18** 11 18.1	− 3 55.1	−0.3986	0.5285	0.1453	+21	−51
79 Cancri	6.3	3.46	12.2	22 26.2	11 45.3	− 3 28.8	−0.4142	0.5283	0.1463	+20	−52
B. A. C. 3138	6.3	3.42	12.3	21 43.8	13 16.1	− 2 1.0	+0.0972	0.5271	0.1491	+48	−24
B. A. C. 3206	6.3	+3.33	−12.8	+20 15.4	18 27.6	+ 3 0.1	+0.8397	0.5231	−0.1581	+90	+15
η Leonis	3.3	3.03	14.9	17 17.4	**19** 15 1.2	− 1 5.7	+0.3863	0.5083	0.1889	+66	−15
42 Leonis	6.0	2.92	15.3	15 31.2	22 19.9	+ 5 59.6	+0.8511	0.5046	0.1979	+90	+10
i Leonis	5.7	2.85	15.6	14 41.5	**20** 3 38.0	+11 8.2	+0.6725	0.5012	0.2042	+90	− 2
k Leonis	5.7	2.70	16.4	14 45.9	11 1.8	− 5 41.0	−0.9464	0.4968	0.2115	−10	−75
ω Virginis	5.9	+2.39	−16.5	+ 8 44.0	**21** 15 10.3	− 2 20.1	−0.7173	0.4861	−0.2326	+ 5	−78
ν Virginis	4.0	+2.33	−16.2	+ 7 8.1	19 17 2	+ 1 39.9	+0.0581	0.4854	−0.2347	+46	−38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's.					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1891.0. Δα	Red'ns from 1891.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
b Virginis	5.8	+2.24	-15.6	+ 4 15.4	22 3 10.5	+ 9 20.5	+1.3340	0.4846	-0.2383	+90	+41
c Virginis	5.5	2.12	16.0	+ 3 54.9	14 42.6	- 3 25.9	-1.0620	0.4838	0.2419	-17	-86
k Virginis	5.9	1.89	14.1	- 3 13.7	23 12 58.6	- 5 45.5	+1.3785	0.4861	0.2440	+87	+47
46 Virginis	6.1	1.89	14.3	2 47.1	13 30.6	- 5 14.4	+0.7612	0.4856	0.2440	+78	- 3
48 Virginis	6.7	1.87	14.2	3 4.8	15 22.9	- 3 25.1	+0.6317	0.4875	0.2442	+83	-10
65 Virginis	6.1	+1.78	-13.9	- 4 21.5	24 2 18.5	+ 7 12.9	-0.6200	0.4914	-0.2429	+10	-83
66 Virginis	6.0	1.77	13.9	4 35.8	2 59.3	+ 7 52.6	-0.5204	0.4919	0.2427	+15	-76
l^1 Virginis	5.1	1.73	13.5	5 41.8	7 8.5	+11 55.1	-0.3082	0.4935	0.2414	+25	-60
m Virginis	5.4	1.69	12.9	8 9.3	12 28.6	- 6 53.5	+1.1310	0.4951	0.2395	+82	+21
B.A.C.4647 *mult.*	6.4	1.63	12.9	7 31.5	19 50.7	+ 0 16.4	-1.3230	0.5000	0.2368	-41	-90
W. xiii, 825	6.8	+1.63	-12.4	- 9 1.7	20 16.4	+ 0 41.5	+0.2440	0.5004	-0.2366	+53	-30
96 Virginis	6.9	1.58	12.1	9 49.3	25 3 26.7	+ 7 39.7	-0.5602	0.5047	0.2328	+11	-78
κ Virginis	4.2	1.56	12.2	9 46.2	5 32.3	+ 9 41.8	-1.1060	0.5056	0.2314	-22	-90
2 Libræ	6.5	1.53	11.7	11 13.2	11 8.8	- 8 51.3	-0.7838	0.5098	0.2278	- 3	-90
Mars				14 29.6	21 47.3	+ 1 28.7	+0.4600	0.4844	0.2074	+63	-19
5 Libræ	6.6	+1.45	-10.4	-15 0.2	22 54.3	+ 2 33.7	+0.7861	0.5182	-0.2180	+67	0
μ Libræ	5.7	1.44	10.7	13 41.8	26 0 39.1	+ 4 15.6	-1.0390	0.5198	0.2163	-20	-90
α^1 Libræ	6.3	1.45	10.3	15 32.8	1 19.7	+ 4 54.8	+0.8636	0.5206	0.2158	+74	+ 5
α^2 Libræ	2.9	1.45	10.3	15 35.5	1 25.7	+ 5 0.7	+0.8913	0.5206	0.2156	+74	+ 6
ν^1 Libræ	5.5	1.39	9.9	15 50.2	9 24.8	-11 14.6	-0.5259	0.5280	0.2072	+ 9	-76
ν^2 Libræ	6.9	+1.39	- 9.9	-16 3.9	9 30.5	-11 9.1	-0.2934	0.5280	-0.2070	+21	-60
28 Libræ	6.0	1.36	9.3	17 46.0	16 28.4	- 4 24.0	+0.1750	0.5337	0.1986	+43	-33
B. A. C. 5109	6.2	1.34	8.8	19 18.1	22 9.9	+ 1 6.7	+0.7630	0.5388	0.1909	+68	- 1
41 Libræ	5.9	1.31	8.7	18 56.6	27 1 11.9	+ 4 3.1	-0.2041	0.5421	0.1866	+22	-54
κ Libræ	5.1	1.32	8.6	19 19.6	2 39.1	+ 5 27.4	-0.0816	0.5434	0.1844	+28	-47
λ Libræ	5.1	+1.29	- 8.3	-19 50.5	8 2.2	+10 40.1	-0.4551	0.5483	-0.1758	+ 8	-71
ω^1 Scorpii	4.6	1.27	8.0	20 22.5	14 17.8	- 7 16.7	-0.9342	0.5542	0.1650	-21	-90
ω^2 Scorpii	4.6	1.27	7.9	20 34.5	14 33.9	- 7 1.1	-0.7584	0.5549	0.1650	-10	-90
ρ Ophiuchi *mult.*	5.0	+ 1.26	- 7.1	-23 11.8	22 47.4	+ 0 55.7	+0.8281	0.5630	-0.1492	+67	+ 5
				NEW	*MOON.*						

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1891.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 7	39 Ophiuchi † *mult.*	5.5	12 21	17 10	167	214	12 50.8	17 39.9	227	272	0 30
	NEW MOON.										
17	B. A. C. 755	6.5	1 0	5 11	83	112	2 11.5	6 23.2	207	211	1 12
19	ω^1 Tauri	6.0	0 41	4 45	27	81	1 42.1	5 45.9	278	328	1 1
21	5 Geminorum	6.7	9 42	13 37	148	89	10 24.7	14 19.5	220	161	0 43
26	*i* Leonis	5.7	12 11	15 46	99	60	13 22.0	16 56.7	326	276	1 11
30	65 Virginis	6.1	8 45	12 4	197	245	8 59.6	12 18.8	222	269	0 15
30	l^2 Virginis	5.1	15 2	18 21	139	114	16 21.2	19 39.7	289	250	1 19
31	κ Virginis	4.2	10 55	14 10	104	143	12 6.6	15 21.5	327	355	1 12
	NEW MOON.										
Feb. 12	*f* Piscium	5.1	3 18	5 47	28	353	4 20.5	6 49.8	265	222	1 3
15	ω^1 Tauri ‡	6.0	10 44	13 1	127	77	11 21.6	13 38.0	215	168	0 37
17	132 Tauri	5.3	5 55	8 4	62	53	7 18.7	9 27.8	283	233	1 24
18	ε Geminorum	3.2	5 52	7 57	92	124	7 25.3	9 30.4	265	232	1 33
19	κ Geminorum	3 6	10 26	12 27	65	7	11 21.9	13 22.5	328	269	0 55
21	B. A. C. 3206	6.3	8 55	10 47	86	100	10 13.4	12 6.2	325	296	1 19
22	η Leonis	3.3	5 32	7 21	19	74	5 36.6	7 25.9	10	65	0 5
24	ν Virginis	4.0	11 18	12 59	85	93	12 22.4	14 3.0	350	335	1 4
Mar. 1	41 Libræ	5.9	16 15	17 36	180	170	16 54.5	18 14.8	234	215	0 39
	NEW MOON.										
16	121 Tauri	6.0	9 53	10 15	156	98	10 20.0	10 42.5	205	148	0 27
18	A Geminorum	5.7	8 2	8 17	95	63	9 29.3	9 44.1	288	232	1 27
29	ω^1 Scorpii †	4.6	10 43	10 14	62	110	11 19.2	10 50.0	350	36	0 36
29	ω^2 Scorpii †	4.6	10 56	10 27	96	144	11 56.2	11 27.0	316	0	1 0
	NEW MOON.										
Apr. 11	ω^2 Tauri ‡	6.3	11 7	9 47	126	77	11 43.5	10 23.6	217	170	0 37
18	*i* Leonis	5.7	12 55	11 8	134	87	14 10.5	12 22.7	302	249	1 15
22	65 Virginis	6.1	8 15	6 12	104	154	9 18.6	7 15.4	319	5	1 4
22	66 Virginis	6.0	9 4	7 0	115	162	10 14.8	8 11.5	313	353	1 11
25	λ Libræ †	5.1	12 24	10 8	107	145	13 35.7	11 20.1	313	341	1 12
May 2	τ^1 Aquarii *mult.*	5.8	17 26	14 42	20	69	18 5.3	15 21.4	301	348	0 39
	NEW MOON.										
12	κ Geminor. *mult.*	3.6	14 2	10 39	130	77	14 48.0	11 25.7	256	208	0 46
14	B. A. C. 3206	6.3	12 4	8 35	142	88	13 12.5	9 42.6	273	217	1 8
15	η Leonis	3.3	7 31	3 58	143	192	8 48.3	5 14.9	265	298	1 17
15	42 Leonis *	6.0	17 17	13 42	114	65	18 8.5	14 33.9	291	247	0 52
17	ν Virginis	4.0	14 16	10 34	57	15	14 52.2	11 10.1	4	319	0 36
22	41 Libræ	5.9	16 2	12 0	92	85	17 20.2	13 18.1	319	296	1 18
22	κ Libræ	5.1	18 11	14 9	104	72	19 28.3	15 25.9	291	248	1 17
June 1	33 Ceti	6.1	19 19	14 37	353	44	19 33.5	14 51.3	318	9	0 15
1	35 Ceti	6.3	19 47	15 5	52	103	20 45.4	16 3.1	252	302	0 58
	NEW MOON.										
18	28 Libræ	6.0	19 25	13 37	153	109	20 5.8	14 17.2	242	195	0 40
27	30 Piscium †	4.6	17 46	11 22	60	110	18 43.6	12 19.4	252	302	0 57

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1891.

Date.	The Star's Name.	The Star's Mag.	Immersion. Washington. Sidereal Time.	Immersion. Washington. Mean Time.	Immersion. Angle from North Point.	Immersion. Angle from Vertex.	Emersion. Washington. Sidereal Time.	Emersion. Washington. Mean Time.	Emersion. Angle from North Point.	Emersion. Angle from Vertex.	Duration of Occultation.
			h m	h m	°	°	h m	h m	°	°	h m
June 27	33 Piscium	4.7	*19 23	12 58	76	124	20 26.8	14 2.3	226	262	1 4
	NEW MOON.										
July 16	κ Libræ	5.1	14 20	6 42	120	137	15 39.6	8 1.4	296	294	1 19
19	ϕ Sagittarii	3.7	19 37	11 46	126	114	20 37.7	12 46.9	226	202	1 1
23	τ^1 Aquarii † *mult.*	5.8	17 18	9 12	57	107	18 18.1	10 11.7	263	309	1 0
29	ω^2 Tauri	5.7	23 17	14 46	123	179	23 51.6	15 20.7	187	243	0 35
	NEW MOON.										
Aug. 18	35 Capricorni	6.2	21 25	11 36	121	120	22 6.6	12 17.6	186	176	0 42
18	37 Capricorni ‡	6.0	1 31	15 42	78	34	2 27.3	16 37.8	230	182	0 56
22	*f* Piscium	5.1	23 29	13 24	100	130	0 19.6	14 14.4	185	202	0 51
25	B. A. C. 1242	6.3	0 6	13 49	36	92	1 8.4	14 51.2	269	323	1 2
	NEW MOON.										
Sept. 10	18 Ophiuchi	6.7	18 10	6 51	125	107	19 27.4	8 8.5	258	226	1 17
12	ϕ Sagittarii	3.7	17 50	6 24	47	57	18 52.1	7 25.3	315	312	1 2
16	τ^1 Aquarii † *mult.*	5.8	17 25	5 42	67	116	18 26.5	6 43.8	251	296	1 1
16	τ^2 Aquarii	4.1	18 54	7 11	355	38	19 15.7	7 32.9	317	358	0 22
22	τ Tauri	4.5	3 15	15 7	95	137	4 28.4	16 20.7	221	226	1 14
28	η Leonis †	3.3	2 58	14 26	89	138	3 55.6	15 24.2	296	348	0 58
	NEW MOON.										
Oct. 5	α^2 Libræ	2.9	17 7	4 10	119	88	18 27.0	5 30.1	291	249	1 20
10	B. A. C. 6666	5.8	22 7	8 50	165	133	Star 0′.1	south of	☽'s	limb.	
12	35 Capricorni	6.2	20 36	7 11	54	64	21 54.8	8 29.6	255	248	1 19
12	37 Capricorni	6.0	1 27	12 2	18	334	2 10.7	12 45.0	288	242	0 43
19	56 Tauri	6.0	6 52	16 58	159	105	6 59.8	17 5.6	172	117	0 7
20	103 Tauri	6.0	0 2	10 5	50	107	1 0.3	11 2.9	270	329	0 58
	NEW MOON.										
Nov. 14	σ Arietis	5.5	7 25	15 49	51	357	8 20.0	16 43.5	269	216	0 55
15	13 Tauri	5.7	4 3	12 23	333	318	Star 0′.6	north of	☽'s	limb.	
17	139 Tauri	5.3	10 21	18 32	95	36	11 16.6	19 27.8	312	256	0 56
	NEW MOON.										
Dec. 7	τ^1 Aquarii *mult.*	5.8	1 28	8 22	147	113	Star 0′.9	south of	☽'s	limb.	
7	τ^2 Aquarii	4.1	2 21	9 15	92	50	3 11.7	10 5.6	205	159	0 51
9	14 Ceti	6.0	4 43	11 28	341	293	4 56.6	11 42.4	314	265	0 14
9	15 Ceti	6.8	5 22	12 7	74	24	6 17.4	13 3.0	229	178	0 56
10	μ Piscium	5.0	5 53	12 35	37	347	6 47.9	13 29.5	269	217	0 55
13	56 Tauri	6.0	7 28	13 58	167	111	Star 0′.9	south of	☽'s	limb.	
13	κ^1 Tauri	4.7	9 46	16 15	80	25	10 43.3	17 12.4	266	214	0 57
13	κ^2 Tauri	6.3	9 47	16 16	100	45	10 42.1	17 11.2	245	193	0 55
14	118 Tauri	5.7	11 15	17 40	67	12	12 6.0	18 31.0	293	242	0 51
17	λ Cancri	5.7	6 22	12 36	128	180	7 44.3	13 57.9	256	278	1 22
18	B. A. C. 3138	6.3	5 20	11 30	77	134	6 34.7	12 44.4	311	5	1 14
19	η Leonis	3.3	7 42	13 48	141	189	9 4.7	15 10.2	272	299	1 22
	NEW MOON.										

NOTE. The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington.
† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h		Lat. 72°			Lat. 66°			Lat. 60°			Lat. 54°			Lat. 48°			Lat. 42°			Lat. 36°		
		x'			x'			x'			x'			x'			x'			x'		
		.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	2	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	6	5	6	7
	20	3	3	4	4	5	5	5	6	7	6	7	9	8	9	11	9	10	12	11	12	14
	30	5	5	6	6	7	8	8	9	11	10	11	13	12	13	16	14	16	18	16	18	22
	40	6	7	8	8	9	11	11	12	14	13	15	17	16	18	21	18	21	24	21	24	29
	50	7	8	10	10	11	13	13	15	17	16	19	21	19	22	26	22	26	30	26	30	36
1	0	9	10	11	12	14	16	16	18	21	19	22	26	23	26	31	26	31	36	30	35	42
	10	10	12	13	14	16	18	18	21	24	22	26	30	26	30	36	31	35	42	35	40	48
	20	12	13	15	16	18	21	21	23	27	25	29	34	30	34	40	35	40	47	39	45	54
	30	13	15	17	18	20	23	23	26	30	28	32	37	33	38	45	39	44	52	43	50	59
	40	14	16	18	20	22	25	25	29	33	31	35	41	36	42	49	42	48	57	47	54	64
	50	16	18	20	21	24	28	27	31	36	34	38	44	39	45	53	45	52	61	51	58	68
2	0	17	19	22	23	26	30	29	33	39	36	41	47	42	48	56	48	55	65	54	62	72
	10	18	20	23	25	28	32	31	36	41	38	43	50	45	51	59	51	59	68	57	66	76
	20	19	22	24	26	30	34	33	38	43	40	46	53	47	54	62	54	62	71	60	69	90
	30	20	23	26	28	31	36	35	40	45	42	48	55	50	56	65	57	64	74	63	72	83
	40	21	24	27	29	33	37	37	42	47	44	50	58	52	59	68	59	67	77	65	74	86
	50	22	25	28	30	34	39	38	43	49	46	52	60	54	61	70	61	69	79	68	76	88
3	0	23	26	30	31	35	40	40	45	51	48	54	62	56	63	72	63	71	81	70	79	90
	10	24	27	31	33	36	42	41	46	53	49	56	63	57	65	74	65	73	83	72	81	92
	20	25	28	32	34	38	43	42	47	54	51	57	65	59	66	75	66	74	85	73	82	93
	30	26	29	33	35	39	44	43	49	55	52	58	66	60	67	77	68	76	86	74	83	95
	40	26	29	33	36	40	45	44	50	56	53	59	67	61	69	78	69	77	87	75	84	96
	50	27	30	34	36	41	46	45	51	57	54	60	68	62	70	79	70	78	88	76	85	96
4	0	28	31	35	37	41	47	46	52	58	55	61	69	63	70	79	71	79	89	77	86	97
	10	28	31	35	38	42	47	47	52	59	56	62	70	64	71	80	71	79	89	78	86	97
	20	29	32	36	38	42	48	47	53	59	56	62	70	64	71	80	72	80	89	78	87	97
	30	29	32	36	39	43	48	48	53	60	57	63	71	65	72	81	72	80	90	79	87	97
	40	29	33	37	39	43	49	48	53	60	57	63	71	65	72	81	72	80	89	79	87	97
	50	30	33	37	39	44	49	48	54	60	57	63	71	65	72	81	72	80	89	79	87	96
5	0	30	33	37	39	44	49	49	54	60	57	63	71	65	72	80	72	80	89	78	86	95
	10	30	33	37	40	44	49	49	54	60	57	63	71	65	72	80	72	79	88	78	86	95
	20	30	33	37	40	44	49	49	54	60	57	63	71	65	71	79	72	79	88	78	85	94
	30	30	33	37	40	44	49	49	54	60	57	63	70	64	71	79	71	78	87	77	85	93
	40	30	33	37	39	44	49	48	53	59	56	62	70	64	70	78	70	77	86	76	84	91
	50	30	33	37	39	43	48	48	53	59	56	61	69	63	70	77	70	77	85	75	83	90
6	0	30	33	37	39	43	48	48	52	58	55	61	68	63	69	76	69	76	84	74	82	89
	10	30	33	37	39	43	47	47	52	58	55	60	67	62	68	75	68	75	82	73	80	87
	20	29	32	36	38	42	47	47	51	57	54	60	66	61	67	74	67	73	81	72	79	85
	30	29	32	36	38	42	46	46	51	56	53	59	65	60	66	73	66	72	80	71	78	84
	40	29	32	35	37	41	46	45	50	55	53	58	64	59	65	71	65	71	78	70	76	82
	50	28	31	35	37	40	45	45	49	54	52	57	62	58	63	70	63	69	76	68	74	80
7	0	28	31	34	36	40	44	44	48	53	51	55	61	57	62	68	62	68	75	67	73	78
	10	27	30	34	35	39	43	43	47	52	50	54	60	56	61	67	61	66	73	65	71	76
	20	27	30	33	35	38	42	42	46	51	48	53	58	54	59	65	59	65	71	64	69	74
	30	26	29	32	34	37	41	41	45	49	47	52	57	53	58	63	58	63	69	62	67	71
	40	26	28	31	33	36	40	40	44	48	46	50	55	51	56	62	56	61	67			
	50	25	27	31	32	35	39	39	42	47	45	49	53	50	54	60	54	59	65			
8	0	24	27	30	31	34	38	38	41	45	43	47	52	48	52	58	53	57	63			
	10	24	26	29	30	33	37	36	40	44	42	46	50	47	51	56	52	55	60			
	20	23	25	28	29	32	35	35	38	42	40	44	48	45	49	54						
	30	22	24	27	28	31	34	34	37	41	39	42	46	43	47	52						
	40	21	23	26	27	30	33	33	35	39	37	41	44	41	45	49						
	50	20	22	25	26	28	31	31	34	37	36	39	42	40	43	47						
9	0	19	21	24	25	27	30	30	32	35	34	37	40									
	10	18	20	22	24	26	28	28	31	34	32	35	38									
	20	18	19	21	22	24	27	27	29	32	31	33	36									
	30	16	18	20	21	23	25	25	27	30	29	31	34									
	40	15	17	19	20	22	24	24	26	28	27	29	32									

(Concluded at bottom of next page.)

DOWNES'S TABLE GIVING VALUES OF τ.

FOR COMPUTING THE TIME AND HOUR-ANGLE OF APPARENT CONJUNCTION.

h	Lat. 30°			Lat. 24°			Lat. 18°			Lat. 12°			Lat. 6°			Lat. 0°		
	x'			x'			x'			x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	6	7	8	7	7	9	7	8	9	7	8	10	7	8	10	8	9	11
20	12	14	16	13	14	18	14	16	19	14	16	20	14	17	21	15	18	21
30	17	20	24	19	22	27	20	24	29	21	25	30	21	25	31	22	26	32
40	23	27	32	25	29	36	26	32	39	28	33	40	28	34	41	29	34	42
50	28	33	40	31	36	44	32	39	48	35	40	50	35	42	51	35	42	52
1 0	33	39	47	36	42	52	38	46	56	40	47	59	41	49	60	41	49	61
10	38	45	54	41	48	59	44	52	63	46	54	67	47	56	68	47	56	69
20	43	50	60	46	54	65	49	58	70	52	60	74	53	62	75	53	63	76
30	48	55	66	51	60	71	54	64	76	57	66	79	58	68	81	59	69	82
40	52	60	71	56	65	77	59	69	82	62	72	84	63	73	87	64	74	88
50	56	64	76	60	69	82	64	74	87	66	77	89	68	76	92	68	79	93
2 0	59	68	80	64	73	86	68	78	91	70	81	95	72	83	97	72	83	98
10	62	72	84	67	77	90	71	81	95	74	85	99	75	87	101	76	87	102
20	65	75	87	70	81	94	74	85	99	77	88	103	78	90	105	79	91	106
30	68	78	90	73	84	97	77	88	102	80	91	106	81	93	108	82	94	109
40	71	81	93	76	87	100	80	91	105	83	94	109	84	96	111	85	97	112
50	74	83	96	78	89	102	82	93	107	85	96	111	87	98	113	87	99	114
3 0	76	85	98	80	91	104	84	95	109	87	98	113	89	100	115	89	101	116
10	77	87	99	82	92	106	86	97	111	89	100	114	91	102	116	91	103	117
20	79	89	101	84	94	107	88	99	112	91	102	115	92	104	118	93	104	118
30	80	90	102	85	95	108	89	100	113	92	103	116	94	105	119	94	105	119
40	81	91	103	86	96	109	90	101	114	93	104	117	95	106	119	95	106	120
50	82	92	104	87	97	110	91	101	114	94	104	118	95	106	120	96	107	120
4 0	83	92	104	88	98	110	92	102	114	94	105	118	96	107	120	97	107	120
10	84	93	104	88	98	110	92	102	114	95	105	118	96	107	120	97	107	120
20	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	120
30	84	93	104	89	98	110	92	102	114	95	105	117	96	107	119	97	107	119
40	84	93	104	89	98	109	92	102	113	95	104	116	96	106	118	97	107	119
50	84	93	103	88	97	108	92	101	113	94	104	115	96	106	117	96	106	118
5 0	84	92	102	88	97	108	91	101	112	94	103	114	95	105	116	96	105	117
10	83	92	102	88	96	107	91	100	110	93	102	113	95	104	115	95	104	115
20	83	91	101	87	95	106	90	99	109	92	101	112	94	103	114	94	103	114
30	82	90	100	86	94	104	89	98	108	92	100	111	93	102	112	93	102	113
40	81	89	98	85	93	103	88	97	106	91	99	109	92	100	110			
50	80	88	97	84	92	101	87	95	105	89	97	107						
6 0	79	87	95	83	91	100	86	94	103	88	96	105						
10	78	85	94	82	89	98	84	92	101									
20	77	84	92	80	88	96	82	91	99									
30	75	82	90	79	86	94												
40	74	81	88	77	84	92												
50	72	79	86															
7 0	71	77	84															

(Concluded from preceding page.)

h	Lat. 72°			Lat. 66°			Lat. 60°			*h*	Lat. 72°			Lat. 66°			Lat. 60°		
	x'			x'			x'				x'			x'			x'		
	.62	.56	.50	.62	.56	.50	.62	.56	.50		.62	.56	.50	.62	.56	.50	.62	.56	.50
h m	m	m	m	m	m	m	m	m	m	h m	m	m	m	m	m	m	m	m	m
9 50	14	16	18	18	20	22	22	24	26	11 0	7	8	8	9	10	11	10	11	12
10 0	13	15	16	17	19	21	20	22	24	10	6	6	7	7	8	9	9	9	10
10	12	14	15	16	17	19	19	21	22	20	5	5	6	6	6	7	7	8	8
20	11	12	14	15	16	17	17	19	20	30	3	4	4	4	5	5			
30	10	11	12	13	14	16	16	17	18	40	2	3	3	3	3	4			
40	9	10	11	12	13	14	14	15	16	50	1	1	1	1	2	2			
50	8	9	10	10	11	12	12	13	14	12 0	0	0	0	0	0	0			

FOR WASHINGTON MEAN NOON.

Date	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.518	99°.4	348°.9	58.4	July 5	0.996	7°.2	218°.6	65.9
6	0.181	129.6	343.4	36.6	10	0.985	14.0	347.3	58.3
11	0.020	163.9	320.9	4.8	15	0.936	29.3	2.6	49.2
16	0.041	156.8	198.6	9.4	20	0.872	41.9	9.8	41.7
21	0.190	128.4	184.8	32.2	25	0.807	52.2	14.8	36.5
26	0.358	106.6	180.3	42.1	30	0.743	60.9	18.5	33.3
31	0.497	90.3	176.5	41.3	Aug. 4	0.681	68.7	21.5	31.6
Feb. 5	0.603	78.1	172.8	37.3	9	0.618	76 4	23.9	31.1
10	0.685	68.3	168.8	33.5	14	0.549	84.9	26.0	31.0
15	0.745	60.6	165.1	30.6	19	0.471	93.3	28.0	31.7
20	0.796	53.7	161.2	28.9	24	0.380	103.9	30.1	31.7
25	0.840	47.2	157.5	28.3	29	0.274	116.9	32.8	29.2
Mar. 2	0.879	40.7	153.7	28.8	Sept. 3	0.149	134.7	37.7	20.7
7	0.915	33.9	150.1	30.6	8	0.050	154.2	48.2	8.8
12	0.950	26.0	145.9	34.0	13	0.007	170.6	130.3	1.4
17	0.979	16.5	139.5	39.5	18	0.076	148.0	193.4	15.2
22	0.998	5.5	109.0	47.4	23	0.261	118.6	202.4	44.9
27	0.989	12.0	347.8	57.5	28	0.494	90.7	206.5	65.4
Apr. 1	0.931	30.5	337.1	66.8	Oct. 3	0.705	65.8	209.3	67.7
6	0.808	52.0	335.1	70.0	8	0.852	45.2	211.4	58.4
11	0.637	74.1	335.2	63.9	13	0.936	29.3	212.9	47.2
16	0.458	94.8	335.8	52.0	18	0.978	16.9	214.6	38.3
21	0.297	113.9	336.4	38.0	23	0.996	7.3	218.7	32.1
26	0.168	131.7	336.5	24.2	28	1.000	1.6	334.3	28.1
May 1	0.068	149.8	336.2	10.9	Nov. 2	0.996	7.6	20.1	25.8
6	0.011	167.8	336.5	2.0	7	0.986	13.8	20.0	24.7
11	0.002	174.2	148.8	0.4	12	0.970	19.8	20.2	24.8
16	0.038	157.5	151.9	6.2	17	0.949	26.1	17.8	25.9
21	0.105	142.2	152.5	14.9	22	0.919	33.0	14.8	28.4
26	0.188	128.6	153.5	22.9	27	0.877	41.1	11.3	32.3
31	0.279	116.3	154.9	29.1	Dec. 2	0.814	51.1	7.5	38.2
June 5	0.376	104.4	156.9	34.4	7	0.720	63.9	3.7	46.1
10	0.477	92.6	159.6	39.4	12	0.578	81.0	0.0	54.0
15	0.593	79.3	163.2	46.0	17	0.379	104.0	356.4	53.8
20	0.715	64.5	167.7	53.7	22	0.152	134.1	351.8	31.6
25	0.842	47.8	174.0	62.1	27	0.011	167.9	319.6	2.8
30	0.946	26.9	183.9	67.5	32	0.064	150.7	198.8	14.5

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superficies of a circle.

i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

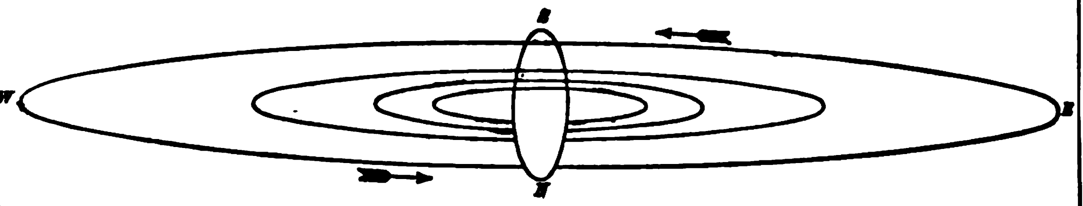
Date.	*k*	*i*	*θ*	*L*	Date.	*k*	*i*	*θ*	*L*
Jan. 1	0.198	127°.1	196°.1	210.0	July 5	0.937	29°.1	175°.5	52.2
6	0.243	120.9	195.0	218.3	10	0.945	27.1	178.6	51.5
11	0.286	115.4	193.7	217.6	15	0.952	25.2	181.8	50.9
16	0.325	110.5	192.0	211.7	20	0.960	23.2	185.2	50.4
21	0.362	106.0	190.1	202.7	25	0.966	21.3	188.5	49.9
26	0.396	102.0	188.1	192.2	30	0.972	19.3	191.8	49.5
31	0.428	98.3	185.9	181.0	Aug. 4	0.977	17.4	195.2	49.1
Feb. 5	0.458	94.9	183.6	170.1	9	0.982	15.4	198.6	48.7
10	0.485	91.7	181.2	159.6	14	0.986	13.5	202.1	48.4
15	0.512	88.7	178.8	149.9	19	0.990	11.6	205.8	48.2
20	0.535	85.8	176.3	140.8	24	0.993	9.7	209.8	48.0
25	0.560	83.1	173.8	132.3	29	0.995	7.8	214.1	47.8
Mar. 2	0.582	80.5	171.3	124.6	Sept. 3	0.997	6.0	220.3	47.6
7	0.604	78.0	168.9	117.6	8	0.999	4.3	230.4	47.5
12	0.624	75.6	166.6	111.2	13	0.999	2.6	250.2	47.5
17	0.644	73.3	164.5	105.3	18	1.000	1.9	294.4	47.4
22	0.662	71.1	162.5	99.8	23	1.000	2.4	338.8	47.4
27	0.680	68.9	160.7	95.1	28	0.999	4.1	358.1	47.4
Apr. 1	0.698	66.7	159.1	90.7	Oct. 3	0.998	5.7	6.2	47.5
6	0.715	64.6	157.7	86.6	8	0.996	7.5	10.8	47.7
11	0.730	62.5	156.5	82.8	13	0.994	9.3	13.3	47.8
16	0.747	60.4	155.6	79.5	18	0.991	11.0	14.4	48.0
21	0.762	58.4	155.0	76.4	23	0.988	12.7	14.9	48.3
26	0.776	56.4	154.6	73.5	28	0.984	14.4	14.8	48.6
May 1	0.791	54.4	154.3	70.9	Nov. 2	0.980	16.1	14.1	48.9
6	0.805	52.4	154.4	68.6	7	0.976	17.8	13.0	49.2
11	0.818	50.5	154.9	66.4	12	0.971	19.5	11.6	49.7
16	0.831	48.6	155.5	64.4	17	0.966	21.2	9.8	50.2
21	0.843	46.6	156.4	62.6	22	0.961	22.8	7.8	50.7
26	0.856	44.7	157.6	61.0	27	0.955	24.5	5.6	51.3
31	0.867	42.8	159.0	59.5	Dec. 2	0.949	26.1	3.3	51.9
June 5	0.879	40.8	160.6	58.2	7	0.943	27.7	0.8	52.7
10	0.890	38.8	162.5	57.0	12	0.936	29.4	358.3	53.5
15	0.900	36.9	164.7	55.8	17	0.928	31.1	355.8	54.4
20	0.910	34.9	167.1	54.7	22	0.921	32.7	353.4	55.4
25	0.919	33.0	169.7	53.8	27	0.912	34.4	351.0	56.4
30	0.928	31.1	172.5	53.0	32	0.904	36.1	348.8	57.5

Mars not being in opposition during the year 1891, the satellites will not be visible.

APPARENT DISK OF MARS.

January	1,	0.897
January	31,	0.921
March	2,	0.943
April	1,	0.962
May	1,	0.978
May	31,	0.990
June	30,	0.998
July	30,	1.000
August	29,	0.996
September	28,	0.989
October	28,	0.976
November	27,	0.959
December	27,	0.943

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1891, AS SEEN IN AN INVERTING TELESCOPE.

(THE VERTICAL SCALE IS THREE TIMES THE HORIZONTAL ONE.)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose: reference to the above diagram enables one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction to correspond to the representation of the orbits of the satellites.

Facing each page of the phenomena of Jupiter's satellites, pages 452—473, is the page of diagrams of configurations, for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, for the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Frequently, at the epoch of the configuration, one or more satellites will be invisible, being projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval on the above diagram of the orbits, by means of the following table of the periods:—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	—	1.76986048
II.	3	13	17	53.735	—	3.55409416
III.	7	3	59	35.854	—	7.16638720
IV.	16	18	5	6.928	—	16.75355241

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	2	9	4.8	May	15	4	47.8	Aug.	1	1	16.5	Oct.	17	20	32.6
	4	3	35.3		16	23	17.0		2	19	42.8		19	14	59.6
	5	22	5.8		18	17	46.1		4	14	9.3		21	9	26.9
	7	16	36.2		20	12	15.2		6	8	35.7		23	3	54.2
	9	11	6.6		22	6	44.3		8	3	2.1		24	22	21.6
	11	5	36.9		24	1	13.3		9	21	28.3		26	16	49.1
	13	0	7.2		25	19	42.3		11	15	54.5		28	11	16.6
March	10	16	22.2		27	14	11.1		13	10	20.7		30	5	44.0
	12	10	52.6		29	8	40.0		15	4	46.9	Nov.	1	0	11.8
	14	5	22.9		31	3	8.7		16	23	12.9		2	18	39.5
	15	23	53.2	June	1	21	37.5		18	17	39.1		4	13	7.4
	17	18	23.4		3	16	6.1		20	12	5.1		6	7	35.2
	19	12	53.7		5	10	34.9		22	6	31.3		8	2	3.2
	21	7	24.0		7	5	3.3		24	0	57.2		9	20	31.2
	23	1	54.3		8	23	31.9		25	19	23.3		11	14	59.4
	24	20	24.5		10	18	0.2		27	13	49.3		13	9	27.5
	26	14	54.6		12	12	28.6		29	8	15.4		15	3	55.9
	28	9	24.8		14	6	56.8		31	2	41.2		16	22	24.2
	30	3	55.1		16	1	25.2	Sept.	1	21	7.2		18	16	52.6
	31	22	25.2		17	19	53.4		3	15	33.1		20	11	21.1
April	2	16	55.3		19	14	21.4		5	9	59.1		22	5	49.8
	4	11	25.4		21	8	49.4		7	4	25.1		24	0	18.4
	6	5	55.4		23	3	17.4		8	22	51.1		25	18	47.1
	8	0	25.3		24	21	45.4		10	17	17.1		27	13	15.9
	9	18	55.3		26	16	13.2		12	11	43.0		29	7	44.8
	11	13	25 2		28	10	41.0		14	6	9.0	Dec.	1	2	13.7
	13	7	55.2		30	5	8.7		16	0	35.0		2	20	42.6
	15	2	25.0	July	1	23	36.3		17	19	1.1		4	15	11.6
	16	20	55.0		3	18	4.0		19	13	27.4		6	9	40.9
	18	15	24.7		5	12	31.5		21	7	53.5		8	4	10.0
	20	9	54.7		7	6	59.0		23	2	19.8		9	22	39.2
	22	4	24.3		9	1	26.4		24	20	46.1		11	17	8.4
	23	22	54.1		10	19	53.7		26	15	12.4		13	11	37.6
	25	17	23.7		12	14	20.8		28	9	38.7		15	6	7.1
	27	11	53.4		14	8	48.0		30	4	5.1		17	0	36.5
	29	6	23.0		16	3	15.2	Oct.	1	22	31.5		18	19	6.0
May	1	0	52.7		17	21	42.3		3	16	58.2		20	13	35.5
	2	19	22.2		19	16	9.1		5	11	24.7		22	8	5.0
	4	13	51.8		21	10	36.0		7	5	51.4		24	2	34.6
	6	8	21.2		23	5	2.8		9	0	18.0		25	21	4.3
	8	2	50.7		24	23	29.8		10	18	44.8		27	15	34.2
	9	21	20.0		26	17	56.5		12	13	11.6		29	10	3.9
	11	15	49.4		28	12	23.3		14	7	38.6		31	4	33.7
	13	10	18.6		30	6	49.9		16	2	5.5				

WASHINGTON MEAN TIMES OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Jan.	4	2 32.0	May	12	5 33.6	July	29	9 7.1	Oct.	15	9 56.8
	7	15 57.5		15	18 54.0	Aug.	1	22 16.1		18	23 7.6
	11	5 24.3		19	8 14.1		5	11 24.7		22	12 19.0
	14	18 50.1		22	21 33.6		9	0 32.8		26	1 31.0
				26	10 52.7		12	13 40.6		29	14 43.6
March	9	4 27.8		30	0 11.4		16	2 48.0	Nov.	2	3 57.1
	12	17 53.1	June	2	13 29.6		19	15 55.2		5	17 10.8
	16	7 19.1		6	2 47.3		23	5 2.0		9	6 25.6
	19	20 44.1		9	16 4.5		26	18 8.8		12	19 40.7
	23	10 9.7		13	5 21.2		30	7 15.3		16	8 56.6
	26	23 34.4		16	18 37.4	Sept.	2	20 21.9		19	22 12.9
	30	12 59.4		20	7 52.8		6	9 28.2		23	11 30.2
April	3	2 23.7		23	21 7.8		9	22 34.9		27	0 47.6
	6	15 48.3		27	10 22.3		13	11 41.6		30	14 6.2
	10	5 12.0		30	23 36.2		17	0 48.7	Dec.	4	3 24.9
	13	18 36.0	July	4	12 49.3		20	13 55.9		7	16 44.7
	17	7 59.2		8	2 2.3		24	3 3.6		11	6 4.5
	20	21 22.5		11	15 14.5		27	16 11.4		14	19 25.2
	24	10 45.0		15	4 26.1	Oct.	1	5 19.8		18	8 45.9
	28	0 7.6		18	17 37.1		4	18 28.3		21	22 7.7
May	1	13 29.5		22	6 47.6		8	7 37.3		25	11 29.5
	5	2 51.3		25	19 57.6		11	20 46.9		29	0 52.2
	8	16 12.5									

SATELLITE III.

		h m			h m			h m			h m
Jan.	5	19 37.0	May	15	3 38.6	Aug.	1	21 48.2	Oct.	19	10 35.4
	13	0 6.4		22	7 48.9		9	1 11.7		26	14 11.7
				29	11 56.3		16	4 31.9	Nov.	2	17 52.5
March	11	12 15.2	June	5	15 59.5		23	7 50.0		9	21 38.3
	18	16 44.2		12	19 58.8		30	11 6.3		17	1 29.1
	25	21 12.4		19	23 53.6	Sept.	6	14 22.4		24	5 24.7
April	2	1 39.4		27	3 43.8		13	17 38.7	Dec.	1	9 24.7
	9	6 5.4	July	4	7 29.8		20	20 55.8		8	13 29.0
	16	10 28.9		11	11 11.0		28	0 15.0		15	17 38.2
	23	14 50.3		18	14 48.2	Oct.	5	3 37.6		22	21 50.5
	30	19 9.1		25	18 20.2		12	7 4.3		30	2 7.3
May	7	23 25.1									

SATELLITE IV.

		h m			h m			h m			h m
Jan.	2	19 23.2	April	30	20 13.1	July	23	13 25.5	Oct.	14	14 21.9
	19	16 9.7	May	17	15 40.8	Aug.	9	4 32.0		31	6 14.8
			June	3	10 26.7		25	18 57.1	Nov.	16	23 10.4
March	11	7 2.8		20	4 23.3	Sept.	11	9 4.9	Dec.	3	17 7.6
	28	3 45.6	July	6	21 24.1		27	23 24.3		20	11 58.7
April	14	0 12.4									

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	10	39		I.	Tr.	In.
	11	22		I.	Sh.	In.
	12	59		I.	Tr.	Eg.
	13	42		I.	Sh.	Eg.
2	3	32		III.	Tr.	In.
	6	23		II.	Tr.	In.
	6	25		III.	Sh.	In.
	7	14		III.	Tr.	Eg.
	7	50		II.	Sh.	In.
	7	55		I.	Oc.	Dis.
	9	19		II.	Tr.	Eg.
	10	7		III.	Sh.	Eg.
	10	46		II.	Sh.	Eg.
	10	54	55.4	I.	Ec.	Re.
	16	56		IV.	Oc.	Dis.
	21	50		IV.	Oc.	Re.
	23	36	37.9	IV.	Ec.	Dis.
3	4	19	43.1	IV.	Ec.	Re.
	5	9		I.	Tr.	In.
	5	51		I.	Sh.	In.
	7	29		I.	Tr.	Eg.
	8	11		I.	Sh.	Eg.
4	1	4		II.	Oc.	Dis.
	2	25		I.	Oc.	Dis.
	5	22	29.4	II.	Ec.	Re.
	5	23	38.1	I.	Ec.	Re.
	23	40		I.	Tr.	In.
5	0	20		I.	Sh.	In.
	2	0		I.	Tr.	Eg.
	2	40		I.	Sh.	Eg.

d	h	m	s			
5	17	46		III.	Oc.	Dis.
	19	48		II.	Tr.	In.
	20	56		I.	Oc.	Dis.
	21	8		II.	Sh.	In.
	22	44		II.	Tr.	Eg.
	23	52	19.3	I.	Ec.	Re.
6	0	2	49.9	III.	Ec.	Re.
	0	4		II.	Sh.	Eg.
	18	10		I.	Tr.	In.
	18	49		I.	Sh.	In.
	20	30		I.	Tr.	Eg.
	21	9		I.	Sh.	Eg.
7	14	30		II.	Oc.	Dis.
	15	26		I.	Oc.	Dis.
	18	21	0.2	I.	Ec.	Re.
	18	41	3.3	II.	Ec.	Re.
8	12	41		I.	Tr.	In.
	13	18		I.	Sh.	In.
	15	1		I.	Tr.	Eg.
	15	38		I.	Sh.	Eg.
9	8	1		III.	Tr.	In.
	9	12		II.	Tr.	In.
	9	56		I.	Oc.	Dis.
	10	26		II.	Sh.	In.
	10	27		III.	Sh.	In.
	11	43		III.	Tr.	Eg.
	12	8		II.	Tr.	Eg.
	12	49	42.4	I.	Ec.	Re.
	13	22		II.	Sh.	Eg.

d	h	m	s			
9	14	9		III.	Sh.	Eg.
10	7	11		I.	Tr.	In.
	7	47		I.	Sh.	In.
	9	32		I.	Tr.	Eg.
	10	7		I.	Sh.	Eg.
11	3	56		II.	Oc.	Dis.
	4	27		I.	Oc.	Dis.
	4	33		IV.	Tr.	In.
	7	18	24.0	I.	Ec.	Re.
	8	0	43.1	II.	Ec.	Re.
	9	28		IV.	Tr.	Eg.
	9	50		IV.	Sh.	In.
	14	45		IV.	Sh.	Eg.
12	1	42		I.	Tr.	In.
	2	16		I.	Sh.	In.
	4	3		I.	Tr.	Eg.
	4	36		I.	Sh.	Eg.
	22	15		III.	Oc.	Dis.
	22	37		II.	Tr.	In.
	22	57		I.	Oc.	Dis.
	23	43		II.	Sh.	In.
13	1	33		II.	Tr.	Eg.
	1	47	4.3	I.	Ec.	Re.
	2	40		II.	Sh.	Eg.
	4	3	48.5	III.	Ec.	Re.
	20	13		I.	Tr.	In.
	20	44		I.	Sh.	In.
	22	33		I.	Tr.	Eg.
	23	5		I.	Sh.	Eg.

THE SATELLITES OF JUPITER

ARE INVISIBLE FROM JANUARY 14 UNTIL MARCH 13,

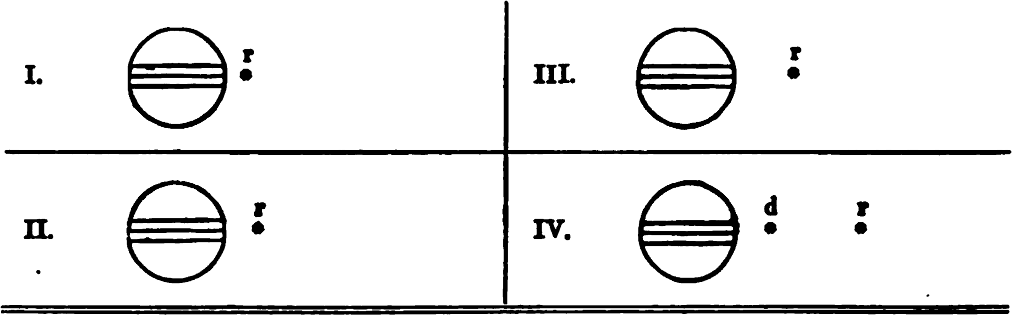
JUPITER BEING TOO NEAR THE SUN.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

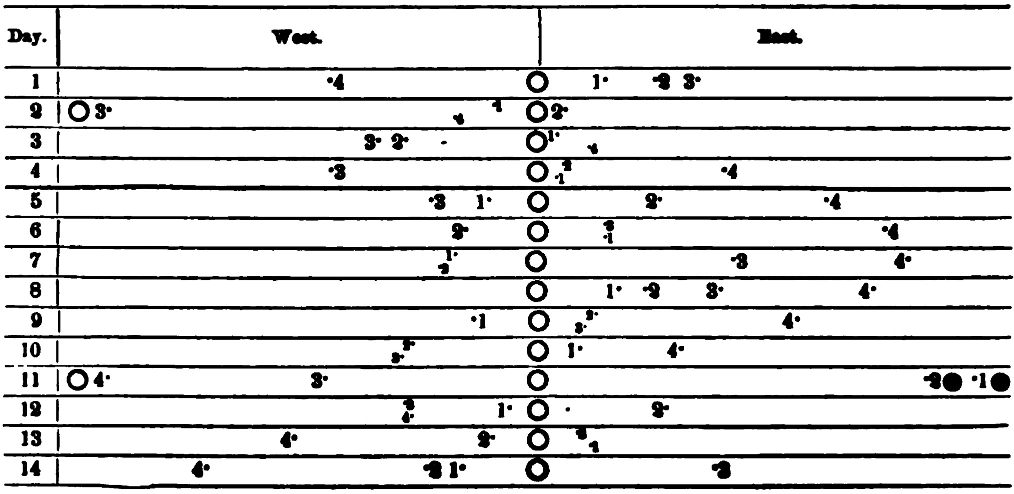
WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 5h for an Inverting Telescope.



WASHINGTON MEAN TIME.

MARCH.

THE SATELLITES OF JUPITER

ARE INVISIBLE FROM JANUARY 14 UNTIL MARCH 13,

JUPITER BEING TOO NEAR THE SUN.

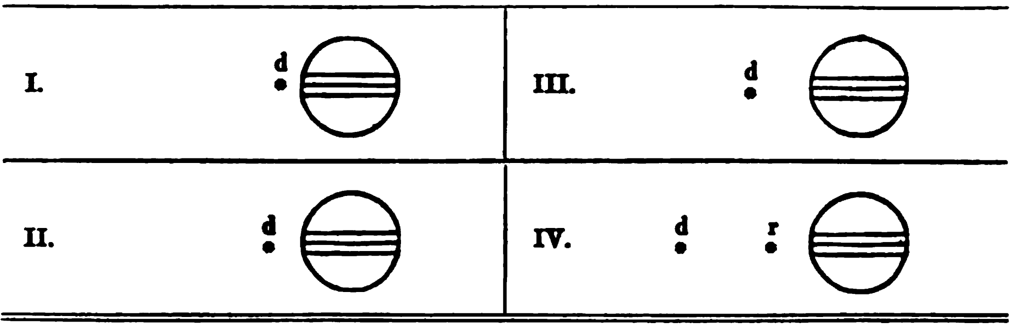
d	h	m	s			
13	6	33		I.	Sh.	In.
	7	3		I.	Tr.	In.
	8	53		I.	Sh.	Eg.
	9	23		I.	Tr.	Eg.
14	3	44	34.0	I.	Ec.	Dis.
	6	33		I.	Oc.	Re.
	9	40		II.	Sh.	In.
	10	43		II.	Tr.	In.
	12	36		II.	Sh.	Eg.
	13	40		II.	Tr.	Eg.
	22	38		III.	Sh.	In.
15	0	46		III.	Tr.	In.
	1	2		I.	Sh.	In.
	1	33		I.	Tr.	In.
	2	18		III.	Sh.	Eg.
	3	22		I.	Sh.	Eg.
	3	53		I.	Tr.	Eg.
	4	26		III.	Tr.	Eg.
	22	13	8.9	I.	Ec.	Dis.
16	1	3		I.	Oc.	Re.
	4	46	13.4	II.	Ec.	Dis.
	8	47		II.	Oc.	Re.
	19	30		I.	Sh.	In.
	20	4		I.	Tr.	In.
	21	50		I.	Sh.	Eg.
	22	24		I.	Tr.	Eg.
17	16	41	39.4	I.	Ec.	Dis.
	19	33		I.	Oc.	Re.
	22	58		II.	Sh.	In.
18	0	8		II.	Tr.	In.
	1	54		II.	Sh.	Eg.
	3	4		II.	Tr.	Eg.
	12	36	27.5	III.	Ec.	Dis.
	13	59		I.	Sh.	In.
	14	34		I.	Tr.	In.
	16	19		I.	Sh.	Eg.
	16	54		I.	Tr.	Eg.
	18	34		III.	Oc.	Re.
19	10	43		IV.	Sh.	In.
	11	10	10.8	I.	Ec.	Dis.
19	14	4		I.	Oc.	Re.
	15	33		IV.	Sh.	Eg.
	16	22		IV.	Tr.	In.
	18	4	15.8	II.	Ec.	Dis.
	21	10		IV.	Tr.	Eg.
	22	12		II.	Oc.	Re.
20	8	28		I.	Sh.	In.
	9	4		I.	Tr.	In.
	10	48		I.	Sh.	Eg.
	11	24		I.	Tr.	Eg.
21	5	38	41.8	I.	Ec.	Dis.
	8	34		I.	Oc.	Re.
	12	16		II.	Sh.	In.
	13	33		II.	Tr.	In.
	15	12		II.	Sh.	Eg.
	16	29		II.	Tr.	Eg.
22	2	38		III.	Sh.	In.
	2	57		I.	Sh.	In.
	3	34		I.	Tr.	In.
	5	15		III.	Tr.	In.
	5	17		I.	Sh.	Eg.
	5	54		I.	Tr.	Eg.
	6	18		III.	Sh.	Eg.
	8	54		III.	Tr.	Eg.
23	0	7	16.2	I.	Ec.	Dis.
	3	4		I.	Oc.	Re.
	7	23	0.6	II.	Ec.	Dis.
	11	38		II.	Oc.	Re.
	21	26		I.	Sh.	In.
	22	5		I.	Tr.	In.
	23	46		I.	Sh.	Eg.
24	0	25		I.	Tr.	Eg.
	18	35	46.1	I.	Ec.	Dis.
	21	34		I.	Oc.	Re.
25	1	33		II.	Sh.	In.
	2	57		II.	Tr.	In.
	4	29		II.	Sh.	Eg.
	5	53		II.	Tr.	Eg.
	15	54		I.	Sh.	In.
	16	35		I.	Tr.	In.
25	16	36	50.0	III.	Ec.	Dis.
	18	14		I.	Sh.	Eg.
	18	55		I.	Tr.	Eg.
	23	2		III.	Oc.	Re.
26	13	4	18.0	I.	Ec.	Dis.
	16	5		I.	Oc.	Re.
	20	40	59.1	II.	Ec.	Dis.
27	1	2		II.	Oc.	Re.
	10	22		I.	Sh.	In.
	11	5		I.	Tr.	In.
	12	42		I.	Sh.	Eg.
	13	25		I.	Tr.	Eg.
	18	33	28.2	IV.	Ec.	Dis.
	23	8	36.8	IV.	Ec.	Re.
28	1	23		IV.	Oc.	Dis.
	6	9		IV.	Oc.	Re.
	7	32	47.4	I.	Ec.	Dis.
	10	34		I.	Oc.	Re.
	14	50		II.	Sh.	In.
	16	21		II.	Tr.	In.
	17	46		II.	Sh.	Eg.
	19	17		II.	Tr.	Eg.
29	4	51		I.	Sh.	In.
	5	36		I.	Tr.	In.
	6	38		III.	Sh.	In.
	7	11		I.	Sh.	Eg.
	7	56		I.	Tr.	Eg.
	9	43		III.	Tr.	In.
	10	18		III.	Sh.	Eg.
	13	22		III.	Tr.	Eg.
30	2	1	21.3	I.	Ec.	Dis.
	5	5		I.	Oc.	Re.
	9	59	35.9	II.	Ec.	Dis.
	14	27		II.	Oc.	Re.
	23	19		I.	Sh.	In.
31	0	6		I.	Tr.	In.
	1	39		I.	Sh.	Eg.
	2	26		I.	Tr.	Eg.
	20	29	50.3	I.	Ec.	Dis.
	23	35		I.	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 30m for an Inverting Telescope.

Day.	West.		East.
13	1·	○	2· 3· ·4
14	2·	○	3· 1· ·4
15	3· 2 ·1	○	4·
16	3·	○	1· ·2 4·
17	·3	○	2· 4· ·1 ●
18	2· 1·	○	4· ·3 ●
19	○ 4· ·2	○	·1 ·3
20	4· 1·	○	·2 3·
21	4· 2·	○	·1 3·
22	4· ·2 3· 1	○	
23	4· 3·	○	1· 2
24	·4 ·3 ·1	○	2·
25	○ 1· ·4 2· ·3	○	
26	·4 ·2	○	·1 ·3
27	1· 4	○	·2 3·
28	○ 2·	○	·1 4 3·
29	·2 ·1 3·	○	·4
30	3·	⊙	·2 1· ·4
31	·2 ·1	⊙	2· ·4

WASHINGTON MEAN TIME.

APRIL.

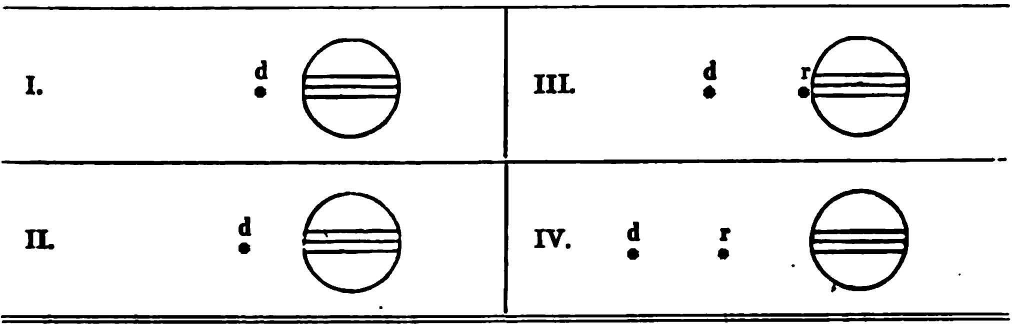
d	h	m	s			
1	4	8		II.	Sh.	In.
	5	45		II.	Tr.	In.
	7	4		II.	Sh.	Eg.
	8	41		II.	Tr.	Eg.
	17	48		I.	Sh.	In.
	18	36		I.	Tr.	In.
	20	8		I.	Sh.	Eg.
	20	37	12.3	III.	Ec.	Dis.
	20	56		I.	Tr.	Eg.
2	3	28		III.	Oc.	Re.
	14	58	22.0	I.	Ec.	Dis.
	18	5		I.	Oc.	Re.
	23	17	30.5	II.	Ec.	Dis.
3	3	52		II.	Oc.	Re.
	12	16		I.	Sh.	In.
	13	6		I.	Tr.	In.
	14	36		I.	Sh.	Eg.
	15	26		I.*	Tr.	Eg.
4	9	26	50.5	I.	Ec.	Dis.
	12	35		I.	Oc.	Re.
	17	26		II.	Sh.	In.
	19	9		II.	Tr.	In.
	20	22		II.	Sh.	Eg.
	22	5		II.	Tr.	Eg.
5	4	56		IV.	Sh.	In.
	6	45		I.	Sh.	In.
	7	36		I.	Tr.	In.
	9	5		I.	Sh.	Eg.
	9	43		IV.	Sh.	Eg.
	9	56		I.	Tr.	Eg.
	10	38		III.	Sh.	In.
	13	1		IV.	Tr.	In.
	14	9		III.	Tr.	In.
	14	18		III.	Sh.	Eg.
	17	44		IV.	Tr.	Eg.
	17	47		III.	Tr.	Eg.
6	3	55	24.1	I.	Ec.	Dis.
	7	5		I.	Oc.	Re.
	12	35	59.4	II.	Ec.	Dis.
	17	16		II.	Oc.	Re.
7	1	14		I.	Sh.	In.
	2	6		I.	Tr.	In.
	3	34		I.	Sh.	Eg.
	4	26		I.	Tr.	Eg.
	22	23	52.8	I.	Ec.	Dis.
8	1	35		I.	Oc.	Re.
	6	44		II.	Sh.	In.
	8	33		II.	Tr.	In.
	9	40		II.	Sh.	Eg.
	11	29		II.	Tr.	Eg.
	19	42		I.	Sh.	In.
	20	36		I.	Tr.	In.
	22	2		I.	Sh.	Eg.
	22	56		I.	Tr.	Eg.
9	0	38	10.6	III.	Ec.	Dis.
	4	7	36.8	III.	Ec.	Re.
	4	17		III.	Oc.	Dis.
	7	54		III.	Oc.	Re.
	16	52	23.9	I.*	Ec.	Dis.
	20	5		I.	Oc.	Re.
10	1	53	50.1	II.	Ec.	Dis.
	6	40		II.	Oc.	Re.
	14	11		I.	Sh.	In.
	15	6		I.*	Tr.	In.
	16	31		I.*	Sh.	Eg.
	17	26		I.	Tr.	Eg.
11	11	20	51.8	I.	Ec.	Dis.
	14	35		I.	Oc.	Re.
11	20	1		II.	Sh.	In.
	21	57		II.	Tr.	In.
	22	57		II.	Sh.	Eg.
12	0	53		II.	Tr.	Eg.
	8	39		I.	Sh.	In.
	9	36		I.	Tr.	In.
	10	59		I.	Sh.	Eg.
	11	56		I.	Tr.	Eg.
	14	39		III.	Sh.	In.
	18	18		III.	Sh.	Eg.
	18	35		III.	Tr.	In.
	22	11		III.	Tr.	Eg.
13	5	49	24.9	I.	Ec.	Dis.
	9	5		I.	Oc.	Re.
	12	44	32.3	IV.	Ec.	Dis.
	15	12	10.8	II.*	Ec.	Dis.
	17	17	1.5	IV.	Ec.	Re.
	20	4		II.	Oc.	Re.
	21	53		IV.	Oc.	Dis.
14	2	31		IV.	Oc.	Re.
	3	8		I.	Sh.	In.
	4	6		I.	Tr.	In.
	5	28		I.	Sh.	Eg.
	6	26		I.	Tr.	Eg.
15	0	17	53.1	I.	Ec.	Dis.
	3	35		I.	Oc.	Re.
	9	19		II.	Sh.	In.
	11	20		II.	Tr.	In.
	12	15		II.	Sh.	Eg.
	14	16		II.	Tr.	Eg.
	21	36		I.	Sh.	In.
	22	37		I.	Tr.	In.
	23	56		I.	Sh.	Eg.
16	0	56		I.	Tr.	Eg.
	4	38	33.4	III.	Ec.	Dis.
	8	7	35.0	III.	Ec.	Re.
	8	41		III.	Oc.	Dis.
	12	17		III.	Oc.	Re.
	18	46	24.1	I.	Ec.	Dis.
	22	5		I.	Oc.	Re.
17	4	29	57.3	II.	Ec.	Dis.
	9	27		II.	Oc.	Re.
	16	5		I.*	Sh.	In.
	17	7		I.	Tr.	In.
	18	25		I.	Sh.	Eg.
	19	26		I.	Tr.	Eg.
18	13	14	51.2	I.	Ec.	Dis.
	16	34		I.*	Oc.	Re.
	22	37		II.	Sh.	In.
19	0	43		II.	Tr.	In.
	1	33		II.	Sh.	Eg.
	3	38		II.	Tr.	Eg.
	10	33		I.	Sh.	In.
	11	37		I.	Tr.	In.
	12	53		I.	Sh.	Eg.
	13	56		I.	Tr.	Eg.
	18	39		III.	Sh.	In.
	22	19		III.	Sh.	Eg.
	22	58		III.	Tr.	In.
20	2	33		III.	Tr.	Eg.
	7	43	24.1	I.	Ec.	Dis.
	11	4		I.	Oc.	Re.
	17	48	9.9	II.	Ec.	Dis.
	22	50		II.	Oc.	Re.
21	5	2		I.	Sh.	In.
	6	7		I.	Tr.	In.
	7	22		I.	Sh.	Eg.
	8	26		I.	Tr.	Eg.
21	23	8		IV.	Sh.	In.
22	2	11	52.1	I.	Ec.	Dis.
	3	53		IV.	Sh.	Eg.
	5	34		I.	Oc.	Re.
	9	21		IV.	Tr.	In.
	11	55		II.	Sh.	In.
	13	55		IV.	Tr.	Eg.
	14	6		II.	Tr.	In.
	14	51		II.	Sh.	Eg.
	17	1		II.	Tr.	Eg.
	23	30		I.	Sh.	In.
23	0	37		I.	Tr.	In.
	1	50		I.	Sh.	Eg.
	2	56		I.	Tr.	Eg.
	8	38	59.4	III.	Ec.	Dis.
	12	7	36.2	III.	Ec.	Re.
	13	3		III.	Oc.	Dis.
	16	38		III.*	Oc.	Re.
	20	40	22.8	I.	Ec.	Dis.
24	0	4		I.	Oc.	Re.
	7	5	53.0	II.	Ec.	Dis.
	12	13		II.	Oc.	Re.
	17	59		I.	Sh.	In.
	19	7		I.	Tr.	In.
	20	19		I.	Sh.	Eg.
	21	26		I.	Tr.	Eg.
25	15	8	49.8	I.*	Ec.	Dis.
	18	33		I.	Oc.	Re.
26	1	13		II.	Sh.	In.
	3	29		II.	Tr.	In.
	4	9		II.	Sh.	Eg.
	6	24		II.	Tr.	Eg.
	12	27		I.	Sh.	In.
	13	36		I.	Tr.	In.
	14	47		I.	Sh.	Eg.
	15	55		I.*	Tr.	Eg.
	22	40		III.	Sh.	In.
27	2	20		III.	Sh.	Eg.
	3	20		III.	Tr.	In.
	6	54		III.	Tr.	Eg.
	9	37	22.4	I.	Ec.	Dis.
	13	3		I.	Oc.	Re.
	20	23	57.3	II.	Ec.	Dis.
28	1	35		II.	Oc.	Re.
	6	56		I.	Sh.	In.
	8	5		I.	Tr.	In.
	9	16		I.	Sh.	Eg.
	10	24		I.	Tr.	Eg.
29	4	5	49.8	I.	Ec.	Dis.
	7	33		I.	Oc.	Re.
	14	31		II.	Sh.	In.
	16	52		II.*	Tr.	In.
	17	27		II.	Sh.	Eg.
	19	47		II.	Tr.	Eg.
30	1	24		I.	Sh.	In.
	2	34		I.	Tr.	In.
	3	44		I.	Sh.	Eg.
	4	53		I.	Tr.	Eg.
	6	55	49.1	IV.	Ec.	Dis.
	11	25	6.9	IV.	Ec.	Re.
	12	38	59.3	III.	Ec.	Dis.
	16	7	9.1	III.*	Ec.	Re.
	17	23		III.	Oc.	Dis.
	17	59		IV.	Oc.	Dis.
	20	56		III.	Oc.	Re.
	22	27		IV.	Oc.	Re.
	22	34	20.6	I.	Ec.	Dis.

Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h 30m for an Inverting Telescope.

Day.	West.	East.
1	2· ·3	○ 1· 4·
2	·2	○ ·3 4· ·1 ●
3	1·	○ ·2 ·3 4·
4		○ 2· ·1 4· 3·
5	2· 1· 3· 4·	○
6	3· 4·	○ 1· ·2 ●
7	4· ·3 ·1	○ 2·
8	4· ·3 2·	○ 1·
9	4· ·2 ·1	○ ·3
10	○ 1· ·4	○ ·2 ·3
11	·4	○ ·1 2· 3·
12	·4 2· 1·	○ 3·
13	3· ·4 ·2	○ ·1
14	·3 ·1	○ ·2 ·4
15	·3 2·	○ 1· ·4
16	·2 ·1	○ ·3 ·4
17		○ 1· ·2 ·3 ·4
18		○ 2· 3· 4· ·1 ●
19	2· 1·	○ 3· 4·
20	3· ·2	○ ·1 4·
21	3· 1·	○ 4· ·2
22	○ 2· ·3 4·	○ 1·
23	4· ·2 ·1	○ ·3 ●
24	4·	○ 1··2 ·3
25	4·	○ 2· 3· ·1 ●
26	·4 2· 1·	○ 3·
27	·4 3· ·2	○ ·1
28	·4 3· 1·	○ ·2
29	·3 ·4	○ 2· ·1
30	·2 ·1 ·4 ·3	○

WASHINGTON MEAN TIME.

MAY.

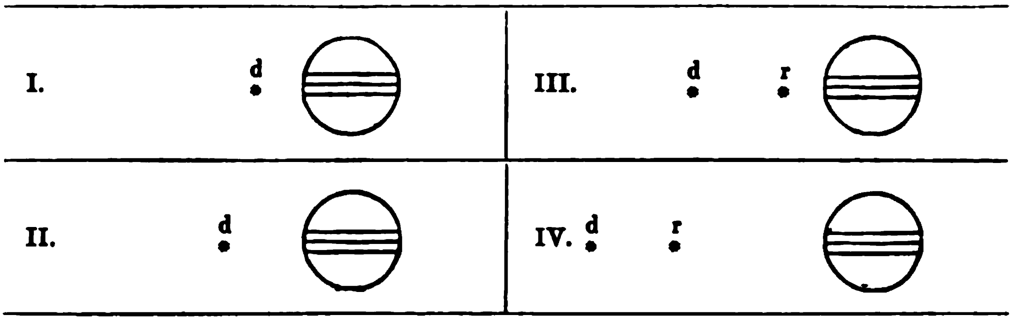
d	h	m	s			
1	2	2		I.	Oc.	Re.
	9	41	36.9	II.	Ec.	Dis.
	14	57		II. *	Oc.	Re.
	19	53		I.	Sh.	In.
	21	4		I.	Tr.	In.
	22	13		I.	Sh.	Eg.
	23	23		I.	Tr.	Eg.
2	17	2	47.3	I.	Ec.	Dis.
	20	32		I.	Oc.	Re.
3	3	49		II.	Sh.	In.
	6	14		II.	Tr.	In.
	6	45		II.	Sh.	Eg.
	9	9		II.	Tr.	Eg.
	14	21		I. *	Sh.	In.
	15	34		I. *	Tr.	In.
	16	41		I.	Sh.	Eg.
	17	53		I.	Tr.	Eg.
4	2	41		III.	Sh.	In.
	6	19		III.	Sh.	Eg.
	7	39		III.	Tr.	In.
	11	11		III.	Tr.	Eg.
	11	31	19.9	I.	Ec.	Dis.
	15	2		I. *	Oc.	Re.
	22	59	33.7	II.	Ec.	Dis.
5	4	19		II.	Oc.	Re.
	8	50		I.	Sh.	In.
	10	4		I.	Tr.	In.
	11	10		I.	Sh.	Eg.
	12	23		I.	Tr.	Eg.
6	5	59	47.2	I.	Ec.	Dis.
	9	31		I.	Oc.	Re.
	17	7		II.	Sh.	In.
	19	36		II.	Tr.	In.
	20	3		II.	Sh.	Eg.
	22	31		II.	Tr.	Eg.
7	3	18		I.	Sh.	In.
	4	33		I.	Tr.	In.
	5	38		I.	Sh.	Eg.
	6	52		I.	Tr.	Eg.
	16	38	57.1	III.	Ec.	Dis.
	20	6	38.7	III.	Ec.	Re.
	21	39		III.	Oc.	Dis.
8	0	28	18.2	I.	Ec.	Dis.
	1	11		III.	Oc.	Re.
	4	0		I.	Oc.	Re.
	12	17	9.8	II.	Ec.	Dis.
	17	21		IV.	Sh.	In.
	17	40		II.	Oc.	Re.
	21	47		I.	Sh.	In.
	22	3		IV.	Sh.	Eg.
	23	2		I.	Tr.	In.
9	0	7		I.	Sh.	Eg.
	1	21		I.	Tr.	Eg.
	5	12		IV.	Tr.	In.
	9	35		IV.	Tr.	Eg.
	18	56	44.4	I.	Ec.	Dis.
	22	30		I.	Oc.	Re.
10	6	24		II.	Sh.	In.
	8	57		II.	Tr.	In.
	9	20		II.	Sh.	Eg.
	11	51		II.	Tr.	Eg.
	16	15		I. *	Sh.	In.
	17	31		I.	Tr.	In.
	18	35		I.	Sh.	Eg.
	19	50		I.	Tr.	Eg.
11	6	40		III.	Sh.	In.
	10	18		III.	Sh.	Eg.
	11	54		III.	Tr.	In.
11	13	25	17.1	I. *	Ec.	Dis.
	15	24		III. *	Tr.	Eg.
	16	59		I.	Oc.	Re.
12	1	34	59.2	II.	Ec.	Dis.
	7	1		II.	Oc.	Re.
	10	44		I.	Sh.	In.
	12	1		I.	Tr.	In.
	13	4		I.	Sh.	Eg.
	14	20		I. *	Tr.	Eg.
13	7	53	44.7	I.	Ec.	Dis.
	11	28		I.	Oc.	Re.
	19	42		II.	Sh.	In.
	22	18		II.	Tr.	In.
	22	38		II.	Sh.	Eg.
14	1	12		II.	Tr.	Eg.
	5	12		I.	Sh.	In.
	6	30		I.	Tr.	In.
	7	32		I.	Sh.	Eg.
	8	49		I.	Tr.	Eg.
	20	39	15.1	III.	Ec.	Dis.
15	0	6	27.5	III.	Ec.	Re.
	1	54		III.	Oc.	Dis.
	2	22	15.4	I.	Ec.	Dis.
	5	24		III.	Oc.	Re.
	5	57		I.	Oc.	Re.
	14	52	31.7	II. *	Ec.	Dis.
	20	21		II.	Oc.	Re.
	23	41		I.	Sh.	In.
16	0	59		I.	Tr.	In.
	2	1		I.	Sh.	Eg.
	3	18		I.	Tr.	Eg.
	20	50	41.4	I.	Ec.	Dis.
17	0	27		I.	Oc.	Re.
	1	7	21.9	IV.	Ec.	Dis.
	5	33	4.3	IV.	Ec.	Re.
	9	0		II.	Sh.	In.
	11	39		II.	Tr.	In.
	11	56		II.	Sh.	Eg.
	13	32		IV. *	Oc.	Dis.
	14	33		II. *	Tr.	Eg.
	17	49		IV.	Oc.	Re.
	18	9		I.	Sh.	In.
	19	28		I.	Tr.	In.
	20	29		I.	Sh.	Eg.
	21	47		I.	Tr.	Eg.
18	10	41		III.	Sh.	In.
	14	18		III. *	Sh.	Eg.
	15	19	14.4	I. *	Ec.	Dis.
	16	6		III. *	Tr.	In.
	18	56		I.	Oc.	Re.
	19	35		III.	Tr.	Eg.
19	4	10	14.3	II.	Ec.	Dis.
	9	41		II.	Oc.	Re.
	12	37		I.	Sh.	In.
	13	57		I. *	Tr.	In.
	14	57		I. *	Sh.	Eg.
	16	16		I. *	Tr.	Eg.
20	9	47	41.8	I.	Ec.	Dis.
	13	25		I.	Oc.	Re.
	22	19		II.	Sh.	In.
21	0	59		II.	Tr.	In.
	1	15		II.	Sh.	Eg.
	3	53		II.	Tr.	Eg.
	7	6		I.	Sh.	In.
	8	26		I.	Tr.	In.
	9	26		I.	Sh.	Eg.
	10	45		I.	Tr.	Eg.
22	0	39	34.4	III.	Ec.	Dis.
22	4	6	16.2	III.	Ec.	Re.
	4	16	13.3	I.	Ec.	Dis.
	6	5		III.	Oc.	Dis.
	7	54		I.	Oc.	Re.
	9	33		III.	Oc.	Re.
	17	27	43.6	II.	Ec.	Dis.
	23	0		II.	Oc.	Re.
23	1	34		I.	Sh.	In.
	2	55		I.	Tr.	In.
	3	54		I.	Sh.	Eg.
	5	14		I.	Tr.	Eg.
	22	44	39.5	I.	Ec.	Dis.
24	2	23		I.	Oc.	Re.
	11	37		II.	Sh.	In.
	14	19		II. *	Tr.	In.
	14	32		II. *	Sh.	Eg.
	17	13		II.	Tr.	Eg.
	20	3		I.	Sh.	In.
	21	24		I.	Tr.	In.
	22	23		I.	Sh.	Eg.
	23	43		I.	Tr.	Eg.
25	11	35		IV.	Sh.	In.
	14	41		III. *	Sh.	In.
	16	13		IV. *	Sh.	Eg.
	17	13	12.6	I.	Ec.	Dis.
	18	18		III.	Sh.	Eg.
	20	15		III.	Tr.	In.
	20	52		I.	Oc.	Re.
	23	43		III.	Tr.	Eg.
26	0	27		IV.	Tr.	In.
	4	38		IV.	Tr.	Eg.
	6	45	20.0	II.	Ec.	Dis.
	12	19		II.	Oc.	Re.
	14	31		I. *	Sh.	In.
	15	53		I. *	Tr.	In.
	16	51		I.	Sh.	Eg.
	18	12		I.	Tr.	Eg.
27	11	41	40.2	I.	Ec.	Dis.
	15	21		I.	Oc.	Re.
28	0	55		II.	Sh.	In.
	3	39		II.	Tr.	In.
	3	50		II.	Sh.	Eg
	6	32		II.	Tr.	Eg.
	9	0		I.	Sh.	In.
	10	22		I.	Tr.	In.
	11	20		I.	Sh.	Eg.
	12	41		I.	Tr.	Eg.
29	4	40	32.3	III.	Ec.	Dis.
	6	10	12.2	I.	Ec.	Dis.
	8	6	41.7	III.	Ec.	Re.
	9	49		I.	Oc.	Re.
	10	13		III.	Oc.	Dis.
	13	40		III. *	Oc.	Re.
	20	2	46.5	II.	Ec.	Dis.
30	1	38		II.	Oc.	Re.
	3	28		I.	Sh.	In.
	4	51		I.	Tr.	In.
	5	48		I.	Sh.	Eg.
	7	10		I.	Tr.	Eg.
31	0	38	38.5	I.	Ec.	Dis.
	4	18		I.	Oc.	Re.
	14	13		II. *	Sh.	In.
	16	58		II.	Tr.	In.
	17	8		II.	Sh.	Eg.
	19	51		II.	Tr.	Eg.
	21	57		I.	Sh.	In.
	23	19		I.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

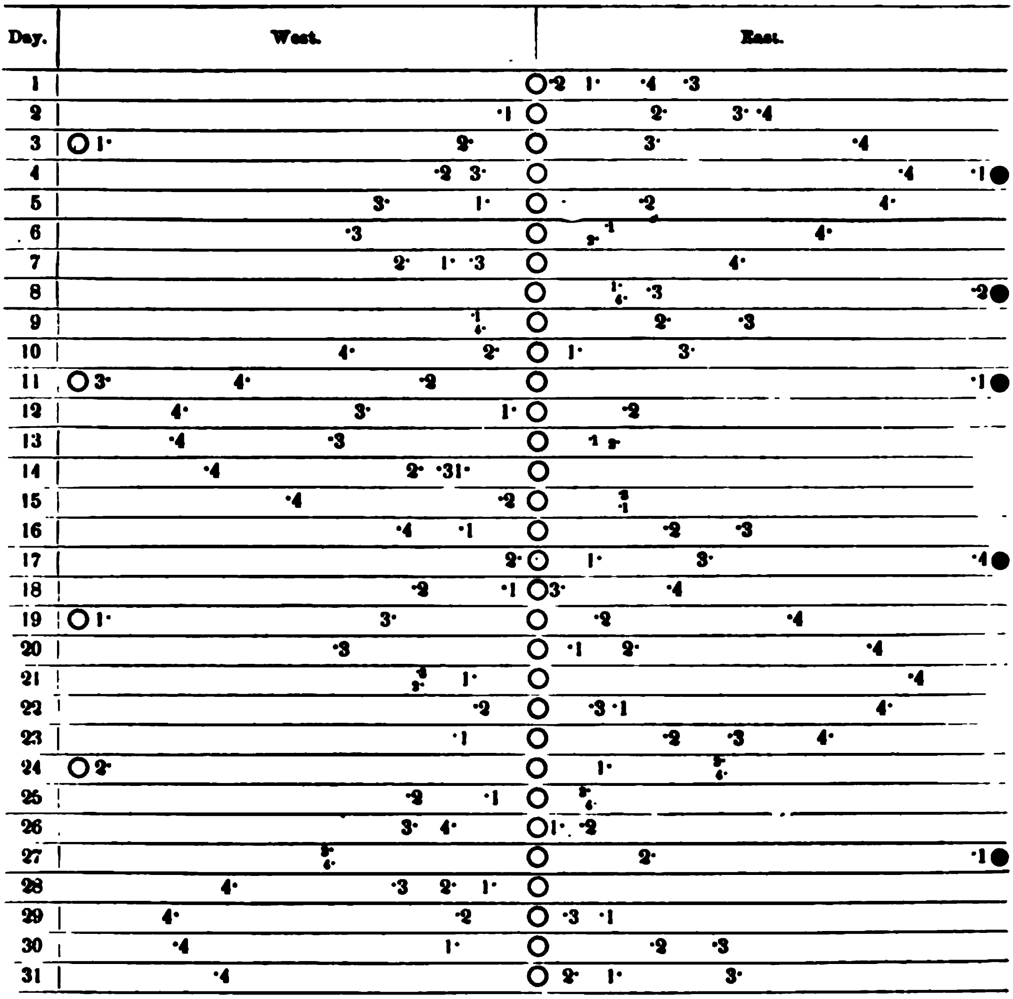
WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15h for an Inverting Telescope.



WASHINGTON MEAN TIME.

JUNE.

d	h	m	s			
1	0	16		I.	Sh.	Eg.
	1	38		I.	Tr.	Eg.
	18	42		III.	Sh.	In.
	19	7	11.7	I.	Ec.	Dis.
	22	18		III.	Sh.	Eg.
	22	47		I.	Oc.	Re.
2	0	21		III.	Tr.	In.
	3	47		III.	Tr.	Eg.
	9	20	17.1	II.	Ec.	Dis.
	14	56		II.*	Oc.	Re.
	16	25		I.	Sh.	In.
	17	48		I.	Tr.	In.
	18	44		I.	Sh.	Eg.
	19	18	52.2	IV.	Ec.	Dis.
	20	7		I.	Tr.	Eg.
	23	40	35.6	IV.	Ec.	Re.
3	8	25		IV.	Oc.	Dis.
	12	29		IV.	Oc.	Re.
	13	35	39.6	I.*	Ec.	Dis.
	17	15		I.	Oc.	Re.
4	3	31		II.	Sh.	In.
	6	17		II.	Tr.	In.
	6	26		II.	Sh.	Eg.
	9	10		II.	Tr.	Eg.
	10	53		I.	Sh.	In.
	12	16		I.	Tr.	In.
	13	12		I.*	Sh.	Eg.
	14	35		I.*	Tr.	Eg.
5	8	4	12.0	I.	Ec.	Dis.
	8	40	56.5	III.	Ec.	Dis.
	11	44		I.	Oc.	Re.
	12	6	31.7	III.	Ec.	Re.
	14	17		III.*	Oc.	Dis.
	17	43		III.	Oc.	Re.
	22	37	41.1	II.	Ec.	Dis.
6	4	14		II.	Oc.	Re.
	5	22		I.	Sh.	In.
	6	45		I.	Tr.	In.
	7	41		I.	Sh.	Eg.
	9	4		I.	Tr.	Eg.
7	2	32	38.4	I.	Ec.	Dis.
	6	13		I.	Oc.	Re.
	16	50		II.	Sh.	In.
	19	36		II.	Tr.	In.
	19	45		II.	Sh.	Eg.
	22	29		II.	Tr.	Eg.
	23	50		I.	Sh.	In.
8	1	13		I.	Tr.	In.
	2	9		I.	Sh.	Eg.
	3	32		I.	Tr.	Eg.
	21	1	12.6	I.	Ec.	Dis.
	22	42		III.	Sh.	In.
9	0	41		I.	Oc.	Re.
	2	17		III.	Sh.	Eg.
	4	23		III.	Tr.	In.
	7	48		III.	Tr.	Eg.
	11	55	7.2	II.	Ec.	Dis.
	17	31		II.	Oc.	Re.
	18	19		I.	Sh.	In.
	19	42		I.	Tr.	In.
	20	38		I.	Sh.	Eg.
	22	0		I.	Tr.	Eg.
10	15	29	40.6	I.*	Ec.	Dis.
	19	9		I.	Oc.	Re.
11	5	48		IV.	Sh.	In.
	6	8		II.	Sh.	In.
	8	54		II.	Tr.	In.
	9	3		II.	Sh.	Eg.
11	10	22		IV.	Sh.	Eg.
	11	46		II.	Tr.	Eg.
	12	47		I.*	Sh.	In.
	14	10		I.*	Tr.	In.
	15	6		I.*	Sh.	Eg.
	16	28		I.	Tr.	Eg.
	18	57		IV.	Tr.	In.
	22	54		IV.	Tr.	Eg.
12	9	58	13.4	I.	Ec.	Dis.
	12	41	26.3	III.*	Ec.	Dis.
	13	38		I.*	Oc.	Re.
	16	6	26.5	III.	Ec.	Re.
	18	17		III.	Oc.	Dis.
	21	41		III.	Oc.	Re.
13	1	12	28.6	II.	Ec.	Dis.
	6	47		II.	Oc.	Re.
	7	16		I.	Sh.	In.
	8	39		I.	Tr.	In.
	9	35		I.	Sh.	Eg.
	10	57		I.	Tr.	Eg.
14	4	26	40.4	I.	Ec.	Dis.
	8	6		I.	Oc.	Re.
	19	26		II.	Sh.	In.
	22	11		II.	Tr.	In.
	22	21		II.	Sh.	Eg.
15	1	4		II.	Tr.	Eg.
	1	44		I.	Sh.	In.
	3	7		I.	Tr.	In.
	4	3		I.	Sh.	Eg.
	5	25		I.	Tr.	Eg.
	22	55	15.1	I.	Ec.	Dis.
16	2	34		I.	Oc.	Re.
	2	43		III.	Sh.	In.
	6	18		III.	Sh.	Eg.
	8	21		III.	Tr.	In.
	11	44		III.	Tr.	Eg.
	14	29	50.4	II.*	Ec.	Dis.
	20	3		II.	Oc.	Re.
	20	12		I.	Sh.	In.
	21	35		I.	Tr.	In.
	22	31		I.	Sh.	Eg.
	23	53		I.	Tr.	Eg.
17	17	23	43.7	I.	Ec.	Dis.
	21	3		I.	Oc.	Re.
18	8	44		II.	Sh.	In.
	11	28		II.	Tr.	In.
	11	39		II.	Sh.	Eg.
	14	20		II.*	Tr.	Eg.
	14	41		I.*	Sh.	In.
	16	3		I.	Tr.	In.
	17	0		I.	Sh.	Eg.
	18	21		I.	Tr.	Eg.
19	11	52	19.5	I.	Ec.	Dis.
	13	30	57.6	IV.*	Ec.	Dis.
	15	31		I.*	Oc.	Re.
	16	41	34.6	III.	Ec.	Dis.
	17	48	20.2	IV.	Ec.	Re.
	20	5	58.4	III.	Ec.	Re.
	22	12		III.	Oc.	Dis.
20	1	35		III.	Oc.	Re.
	2	28		IV.	Oc.	Dis.
	3	47	9.9	II.	Ec.	Dis.
	6	19		IV.	Oc.	Re.
	9	9		I.	Sh.	In.
	9	20		II.	Oc.	Re.
	10	31		I.	Tr.	In.
	11	28		I.	Sh.	Eg.
20	12	49		I.*	Tr.	Eg.
21	6	20	45.1	I.	Ec.	Dis.
	9	59		I.	Oc.	Re.
	22	3		II.	Sh.	In.
22	0	45		II.	Tr.	In.
	0	58		II.	Sh.	Eg.
	3	37		II.	Tr.	Eg.
	3	37		I.	Sh.	In.
	4	59		I.	Tr.	In.
	5	56		I.	Sh.	Eg.
	7	17		I.	Tr.	Eg.
23	0	49	20.6	I.	Ec.	Dis.
	4	27		I.	Oc.	Re.
	6	43		III.	Sh.	In.
	10	17		III.	Sh.	Eg.
	12	15		III.	Tr.	In.
	15	36		III.*	Tr.	Eg.
	17	4	28.6	II.	Ec.	Dis.
	22	6		I.	Sh.	In.
	22	35		II.	Oc.	Re.
	23	27		I.	Tr.	In.
24	0	25		I.	Sh.	Eg.
	1	45		I.	Tr.	Eg.
	19	17	50.0	I.	Ec.	Dis.
	22	55		I.	Oc.	Re.
25	11	21		II.	Sh.	In.
	14	1		II.*	Tr.	In.
	14	16		II.*	Sh.	Eg.
	16	34		I.	Sh.	In.
	16	53		II.	Tr.	Eg.
	17	55		I.	Tr.	In.
	18	53		I.	Sh.	Eg.
	20	13		I.	Tr.	Eg.
26	13	46	24.7	I.*	Ec.	Dis.
	17	22		I.	Oc.	Re.
	20	41	45.8	III.	Ec.	Dis.
27	0	5	32.0	III.	Ec.	Re.
	2	3		III.	Oc.	Dis.
	5	24		III.	Oc.	Re.
	6	21	46.6	II.	Ec.	Dis.
	11	3		I.	Sh.	In.
	11	48		II.	Oc.	Re.
	12	23		I.	Tr.	In.
	13	22		I.*	Sh.	Eg.
	14	41		I.*	Tr.	Eg.
28	0	2		IV.	Sh.	In.
	4	31		IV.	Sh.	Eg.
	8	14	52.8	I.	Ec.	Dis.
	11	50		I.	Oc.	Re.
	12	34		IV.*	Tr.	In.
	16	18		IV.	Tr.	Eg.
29	0	40		II.	Sh.	In.
	3	16		II.	Tr.	In.
	3	35		II.	Sh.	Eg.
	5	31		I.	Sh.	In.
	6	8		II.	Tr.	Eg.
	6	50		I.	Tr.	In.
	7	50		I.	Sh.	Eg.
	9	8		I.	Tr.	Eg.
30	2	43	29.1	I.	Ec.	Dis.
	6	18		I.	Oc.	Re.
	10	43		III.	Sh.	In.
	14	17		III.*	Sh.	Eg.
	16	3		III.	Tr.	In.
	19	23		III.	Tr.	Eg.
	19	39	3.1	II.	Ec.	Dis.
	23	59		I.	Sh.	In.

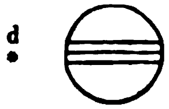
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

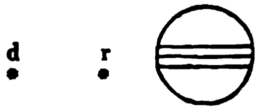
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

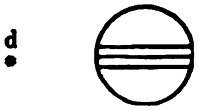
I.



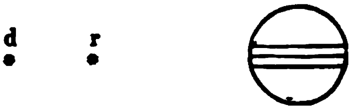
III.



II.



IV.



Configurations at 14ʰ for an Inverting Telescope.

Day.	West.		East.
1	·4 2· ·1	○	3·
2	·4 3·	○	1· ·2●
3	3·	○	·4 2· ·1●
4	·3 2· 1·	○	·4
5	·2 ·3	○	·1 ·4
6	1·	○	·2 ·3 ·4
7		○	2·· 1 3· ·4
8	2· ·1	○	3· 4·
9	3· ·2	○	1· 4·
10	3· ·1	○	2· 4·
11	·3 2·	○	4· 1·
12	2 4· ·3	○	·1
13	4· 1·	○	·2 ·3
14	4·	○	1 2· ·3
15	4· 2· 1·	○	3·
16	·4 3 2·	○	1·
17	·4 3· ··1	○	·2
18	○ 2· 4 3	○	1·
19	·2 4 3	○	·1●
20	1·	○	4 2 ·3
21		○	·1 2· ·4 ·3
22	2· 1·	○	3· ·4
23	○ 3· ·2	○	1· ·4
24	3· ·1	○	·2 4·
25	·3	○	2 1· 4·
26	·2 ·3 ·1	○	4·
27	○ 1·	○	·2 ·3 4·
28	○ 4·	○	·1 2· ·3
29	4· 2 1·	○	3·
30	4· ·2	○	3· ·1

WASHINGTON MEAN TIME.

JULY.

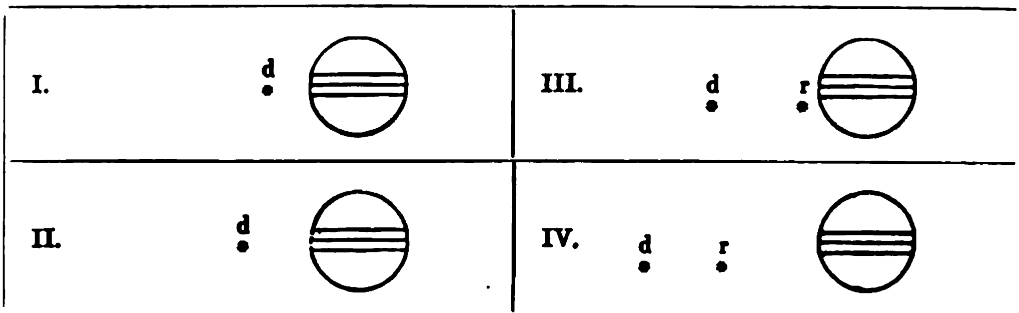
d	h	m	s			
1	1	2		II.	Oc.	Re.
	1	17		I.	Tr.	In.
	2	18		I.	Sh.	Eg.
	3	35		I.	Tr.	Eg.
	21	11	59.7	I.	Ec.	Dis.
2	0	45		I.	Oc.	Re.
	13	58		II.*	Sh.	In.
	16	31		II.	Tr.	In.
	16	53		II.	Sh.	Eg.
	18	28		I.	Sh.	In.
	19	23		II.	Tr.	Eg.
	19	45		I.	Tr.	In.
	20	47		I.	Sh.	Eg.
	22	3		I.	Tr.	Eg.
3	15	40	35.6	I.	Ec.	Dis.
	19	13		I.	Oc.	Re.
4	0	42	22.5	III.	Ec.	Dis.
	4	5	29.9	III.	Ec.	Re.
	5	50		III.	Oc.	Dis.
	8	56	20.0	II.	Ec.	Dis.
	9	10		III.	Oc.	Re.
	12	56		I.*	Sh.	In.
	14	12		I.*	Tr.	In.
	14	15		II.*	Oc.	Re.
	15	15		I.*	Sh.	Eg.
	16	30		I.	Tr.	Eg.
5	10	9	4.4	I.*	Ec.	Dis.
	13	41		I.*	Oc.	Re.
6	3	17		II.	Sh.	In.
	5	45		II.	Tr.	In.
	6	12		II.	Sh.	Eg.
	7	25		I.	Sh.	In.
	7	43	35.4	IV.	Ec.	Dis.
	8	36		II.	Tr.	Eg.
	8	40		I.	Tr.	In.
	9	44		I.	Sh.	Eg.
	10	58		I.*	Tr.	Eg.
	11	56	10.4	IV.*	Ec.	Re.
	19	35		IV.	Oc.	Dis.
	23	13		IV.	Oc.	Re.
7	4	37	41.7	I.	Ec.	Dis.
	8	8		I.	Oc.	Re.
	14	43		III.*	Sh.	In.
	18	16		III.	Sh.	Eg.
	19	46		III.	Tr.	In.
	22	13	35.1	II.	Ec.	Dis.
	23	6		III.	Tr.	Eg.
8	1	53		I.	Sh.	In.
	3	7		I.	Tr.	In.
	3	28		II.	Oc.	Re.
	4	12		I.	Sh.	Eg.
	5	25		I.	Tr.	Eg.
	23	6	13.0	I.	Ec.	Dis.
9	2	35		I.	Oc.	Re.
	16	35		II.	Sh.	In.
	18	59		II.	Tr.	In.
	19	30		II.	Sh.	Eg.
	20	22		I.	Sh.	In.
	21	34		I.	Tr.	In.
	21	50		II.	Tr.	Eg.
	22	41		I.	Sh.	Eg.
	23	52		I.	Tr.	Eg.
10	17	34	50.0	I.	Ec.	Dis.
	21	3		I.	Oc.	Re.
11	4	43	3.7	III.	Ec.	Dis.
	8	5	30.7	III.	Ec.	Re.
	9	32		III.	Oc.	Dis.
	11	30	51.4	II.*	Ec.	Dis.
	12	50		III.*	Oc.	Re.
11	14	50		I.*	Sh.	In.
	16	1		I.*	Tr.	In.
	16	40		II.	Oc.	Re.
	17	9		I.	Sh.	Eg.
	18	19		I.	Tr.	Eg.
12	12	3	19.8	I.*	Ec.	Dis.
	15	30		I.	Oc.	Re.
13	5	54		II.	Sh.	In.
	8	12		II.	Tr.	In.
	8	49		II.	Sh.	Eg.
	9	18		I.	Sh.	In.
	10	28		I.*	Tr.	In.
	11	3		II.*	Tr.	Eg.
	11	37		I.*	Sh.	Eg.
	12	46		I.*	Tr.	Eg.
14	6	31	58.2	I.	Ec.	Dis.
	9	57		I.*	Oc.	Re.
	18	16		IV.	Sh.	In.
	18	43		III.	Sh.	In.
	22	15		III.	Sh.	Eg.
	22	42		IV.	Sh.	Eg.
	23	25		III.	Tr.	In.
15	0	48	6.1	II.	Ec.	Dis.
	2	43		III.	Tr.	Eg.
	3	47		I.	Sh.	In.
	4	55		I.	Tr.	In.
	5	13		IV.	Tr.	In.
	5	51		II.	Oc.	Re.
	6	6		I.	Sh.	Eg.
	7	13		I.	Tr.	Eg.
	8	44		IV.	Tr.	Eg.
16	1	0	30.7	I.	Ec.	Dis.
	4	24		I.	Oc.	Re.
	19	13		II.	Sh.	In.
	21	25		II.	Tr.	In.
	22	7		II.	Sh.	Eg.
	22	15		I.	Sh.	In.
	23	22		I.	Tr.	In.
17	0	16		II.	Tr.	Eg.
	0	34		I.	Sh.	Eg.
	1	40		I.	Tr.	Eg.
	19	29	8.8	I.	Ec.	Dis.
	22	51		I.	Oc.	Re.
18	8	44	26.2	III.	Ec.	Dis.
	12	6	11.6	III.*	Ec.	Re.
	13	9		III.*	Oc.	Dis.
	14	5	22.2	II.*	Ec.	Dis.
	16	27		III.	Oc.	Re.
	16	43		I.	Sh.	In.
	17	49		I.	Tr.	In.
	19	2		II.	Oc.	Re.
	19	2		I.	Sh.	Eg.
	20	7		I.	Tr.	Eg.
19	13	57	40.1	I.*	Ec.	Dis.
	17	18		I.	Oc.	Re.
20	8	32		II.	Sh.	In.
	10	38		II.*	Tr.	In.
	11	12		I.*	Sh.	In.
	11	26		II.*	Sh.	Eg.
	12	16		I.*	Tr.	In.
	13	29		II.*	Tr.	Eg.
	13	31		I.*	Sh.	Eg.
	14	34		I.*	Tr.	Eg.
21	8	26	19.8	I.	Ec.	Dis.
	11	45		I.*	Oc.	Re.
	22	44		III.	Sh.	In.
22	2	16		III.	Sh.	Eg.
	3	0		III.	Tr.	In.
	3	22	37.3	II.	Ec.	Dis.
22	5	40		I.	Sh.	In.
	6	17		III.	Tr.	Eg.
	6	42		I.	Tr.	In.
	7	59		I.	Sh.	Eg.
	8	13		II.	Oc.	Re.
	9	0		I.	Tr.	Eg.
23	1	56	32.0	IV.	Ec.	Dis.
	2	54	53.6	I.	Ec.	Dis.
	6	4	0.2	IV.	Ec.	Re.
	6	12		I.	Oc.	Re.
	11	41		IV.*	Oc.	Dis.
	15	10		IV.*	Oc.	Re.
	21	50		II.	Sh.	In.
	23	50		II.	Tr.	In.
24	0	9		I.	Sh.	In.
	0	44		II.	Sh.	Eg.
	1	9		I.	Tr.	In.
	2	28		I.	Sh.	Eg.
	2	41		II.	Tr.	Eg.
	3	27		I.	Tr.	Eg.
	21	23	33.2	I.	Ec.	Dis.
25	0	39		I.	Oc.	Re.
	12	45	18.7	III.*	Ec.	Dis.
	16	6	21.5	III.*	Ec.	Re.
	16	39	54.5	II.	Ec.	Dis.
	16	42		III.	Oc.	Dis.
	18	37		I.	Sh.	In.
	19	35		I.	Tr.	In.
	19	59		III.	Oc.	Re.
	20	56		I.	Sh.	Eg.
	21	23		II.	Oc.	Re.
	21	53		I.	Tr.	Eg.
26	15	52	5.6	I.*	Ec.	Dis.
	19	6		I.	Oc.	Re.
27	11	9		II.*	Sh.	In.
	13	1		II.*	Tr.	In.
	13	6		I.*	Sh.	In.
	14	1		I.*	Tr.	In.
	14	3		II.*	Sh.	Eg.
	15	25		I.*	Sh.	Eg.
	15	52		II.*	Tr.	Eg.
	16	19		I.	Tr.	Eg.
28	10	20	46.6	I.*	Ec.	Dis.
	13	32		I.*	Oc.	Re.
29	2	45		III.	Sh.	In.
	5	57	11.0	II.	Ec.	Dis.
	6	16		III.	Sh.	Eg.
	6	30		III.	Tr.	In.
	7	34		I.	Sh.	In.
	8	28		I.	Tr.	In.
	9	47		III.	Tr.	Eg.
	9	53		I.*	Sh.	Eg.
	10	32		II.*	Oc.	Re.
	10	46		I.*	Tr.	Eg.
30	4	49	21.6	I.	Ec.	Dis.
	7	59		I.	Oc.	Re.
31	0	28		II.	Sh.	In.
	2	3		I.	Sh.	In.
	2	12		II.	Tr.	In.
	2	55		I.	Tr.	In.
	3	22		II.	Sh.	Eg.
	4	22		I.	Sh.	Eg.
	5	3		II.	Tr.	Eg.
	5	13		I.	Tr.	Eg.
	12	31		IV.*	Sh.	In.
	16	51		IV.	Sh.	Eg.
	20	50		IV.	Tr.	In.
	23	18	3.0	I.	Ec.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis , disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 30m for an Inverting Telescope.

Day.	West.		East.
1	4· 3· ·1	O	·2
2	4· ·3	O	2· 1·
3	·4 2· ·3 ·1	O	
4	·4	O	1· ·3 ·2●
5	·4	O	2· ·3 ·1●
6	·4 1· 2	O	3·
7	·2	O	2· ·1 ·4
8	3· 1·	O	·2 ·4
9	3·	O	1· 2· ·4
10	3 2· ·1	O	·4
11	·2	O	·3 1· 4·
12		O	2· ·3 4· ·1●
13	1· 2·	O	3· 4·
14	·2	O	·1 3· 4·
15	3· 1· 4·	O	·2
16	3· 4·	O	·1 2·
17	4· ·3 2· ·1	O	
18	4· ·2	O	1· ·3●
19	·4 ·1	O	·2 ·3
20	O 1· ·4 2·	O	3·
21	·4 ·2	O	·1 3·
22	·4 1· 2·	O	·2
23	3·	O	·1 2· ·4●
24	·3 2· ·1	O	·4
25	·2 ·3	O	1· ·4
26	·1	O	3 2 ·4
27	O 2·	O	1· 3· ·4
28	·2	O	3· 4· ·1●
29	1· 2·	O	·2 4·
30	3·	O	·1 2· 4·
31	·3 1· 2·	O	4·

WASHINGTON MEAN TIME.

AUGUST.

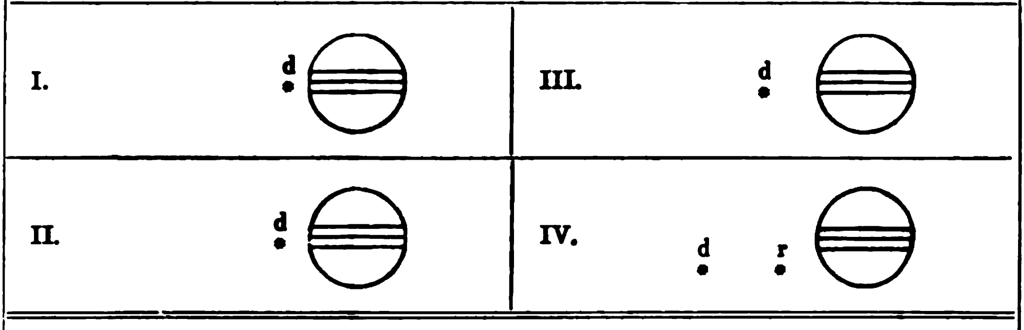
d	h	m	s			
1	0	17		IV.	Tr.	Eg.
	2	25		I.	Oc.	Re.
	16	46	19.9	III.*	Ec.	Dis.
	19	14	29.7	II.	Ec.	Dis.
	20	6	38.9	III.	Ec.	Re.
	20	10		III.	Oc.	Dis.
	20	31		I.	Sh.	In.
	21	22		I.	Tr.	In.
	22	50		I.	Sh.	Eg.
	23	27		III.	Oc.	Re.
	23	40		I.	Tr.	Eg.
	23	41		II.	Oc.	Re.
2	17	46	36.9	I.	Ec.	Dis.
	20	52		I.	Oc.	Re.
3	13	47		II.*	Sh.	In.
	15	0		I.*	Sh.	In.
	15	22		II.*	Tr.	In.
	15	49		I.*	Tr.	In.
	16	41		II.*	Sh.	Eg.
	17	19		I.	Sh.	Eg.
	18	7		I.	Tr.	Eg.
	18	13		II.	Tr.	Eg.
4	12	15	19.5	I.*	Ec.	Dis.
	15	18		I.*	Oc.	Re.
5	6	46		III.	Sh.	In.
	8	31	48.4	II.*	Ec.	Dis.
	9	28		I.*	Sh.	In.
	9	54		III.*	Tr.	In.
	10	15		I.*	Tr.	In.
	10	17		III.*	Sh.	Eg.
	11	47		I.*	Sh.	Eg.
	12	33		I.*	Tr.	Eg.
	12	50		II.*	Oc.	Re.
	13	13		III.*	Tr.	Eg.
6	6	43	56.4	I.	Ec.	Dis.
	9	45		I.*	Oc.	Re.
7	3	6		II.	Sh.	In.
	3	57		I.	Sh.	In.
	4	32		II.	Tr.	In.
	4	41		I.	Tr.	In.
	6	0		II.	Sh.	Eg.
	6	16		I.	Sh.	Eg.
	6	59		I.	Tr.	Eg.
	7	23		II.	Tr.	Eg.
8	1	12	39.2	I.	Ec.	Dis.
	4	11		I.	Oc.	Re.
	20	10	47.6	IV.	Ec.	Dis.
	20	47	5.8	III.	Ec.	Dis.
	21	49	9.4	II.	Ec.	Dis.
	22	25		I.	Sh.	In.
	23	7		I.	Tr.	In.
9	0	12	20.6	IV.	Ec.	Re.
	0	44		I.	Sh.	Eg.
	1	25		I.	Tr.	Eg.
	1	58		II.	Oc.	Re.
	2	47		IV.	Oc.	Dis.
	2	50		III.	Oc.	Re.
	6	17		IV.	Oc.	Re.
	19	41	14.7	I.	Ec.	Dis.
	22	37		I.	Oc.	Re.
10	16	25		II.*	Sh.	In.
	16	54		I.	Sh.	In.
	17	33		I.	Tr.	In.
	17	42		II.	Tr.	In.
	19	13		I.	Sh.	Eg.
10	19	19		II.	Sh.	Eg.
	19	51		I.	Tr.	Eg.
	20	33		II.	Tr.	Eg.
11	14	9	58.7	I.*	Ec.	Dis.
	17	3		I.	Oc.	Re.
12	10	47		III.*	Sh.	In.
	11	6	31.4	II.*	Ec.	Dis.
	11	22		I.*	Sh.	In.
	11	59		I.*	Tr.	In.
	13	18		III.*	Tr.	In.
	13	41		I.*	Sh.	Eg.
	14	16		III.*	Sh.	Eg.
	14	17		I.*	Tr.	Eg.
	15	6		II.*	Oc.	Re.
	16	35		III.*	Tr.	Eg.
13	8	38	37.2	I.*	Ec.	Dis.
	11	30		I.*	Oc.	Re.
14	5	44		II.	Sh.	In.
	5	51		I.	Sh.	In.
	6	25		I.	Tr.	In.
	6	51		II.	Tr.	In.
	8	10		I.*	Sh.	Eg.
	8	38		II.*	Sh.	Eg.
	8	43		I.*	Tr.	Eg.
	9	42		II.*	Tr.	Eg.
15	3	7	22.0	I.	Ec.	Dis.
	5	56		I.	Oc.	Re.
16	0	19		I.	Sh.	In.
	0	23	55.2	II.	Ec.	Dis
	0	48	0.2	III.	Ec.	Dis.
	0	51		I.	Tr.	In.
	2	38		I.	Sh.	Eg.
	3	9		I.	Tr.	Eg.
	4	13		II.	Oc.	Re.
	6	11		III.	Oc.	Re.
	21	35	59.2	I.	Ec.	Dis.
17	0	22		I.	Oc.	Re.
	6	47		IV.	Sh.	In.
	11	1		IV.*	Sh.	Eg.
	11	35		IV.*	Tr.	In.
	15	6		IV.*	Tr.	Eg.
	18	48		I.	Sh.	In.
	19	2		II.	Sh.	In.
	19	17		I.	Tr.	In.
	20	0		II.	Tr.	In.
	21	7		I.	Sh.	Eg.
	21	35		I.	Tr.	Eg.
	21	56		II.	Sh.	Eg.
	22	51		II.	Tr.	Eg.
18	16	4	44.6	I.*	Ec.	Dis.
	18	48		I.	Oc.	Re.
19	13	16		I.*	Sh.	In.
	13	41	21.1	II.*	Ec.	Dis.
	13	43		I.*	Tr.	In.
	14	48		III.*	Sh.	In.
	15	35		I.*	Sh.	Eg.
	16	1		I.*	Tr.	Eg.
	16	37		III.*	Tr.	In.
	17	21		II.	Oc.	Re.
	18	16		III.	Sh.	Eg.
	19	54		III.	Tr.	Eg.
20	10	33	24.8	I.*	Ec.	Dis.
	13	14		I.*	Oc.	Re.
21	7	45		I.*	Sh.	In.
	8	9		I.*	Tr.	In.
21	8	21		II.*	Sh.	In.
	9	9		II.*	Tr.	In.
	10	4		I.*	Sh.	Eg.
	10	27		I.*	Tr.	Eg.
	11	14		II.*	Sh.	Eg.
	12	0		II.*	Tr.	Eg.
22	5	2	11.3	I.	Ec.	Dis.
	7	40		I.*	Oc.	Re.
23	2	13		I.	Sh.	In.
	2	34		I.	Tr.	In.
	2	58	48.6	II.	Ec.	Dis.
	4	32		I.	Sh.	Eg.
	4	49	25.6	III.	Ec.	Dis.
	4	52		I.	Tr.	Eg.
	6	27		II.	Oc.	Re.
	9	29		III.*	Oc.	Re.
	23	30	50.1	I.	Ec.	Dis.
24	2	6		I.	Oc.	Re.
	20	42		I.	Sh.	In.
	21	0		I.	Tr.	In.
	21	40		II.	Sh.	In.
	22	17		II.	Tr.	In.
	23	1		I.	Sh.	Eg.
	23	18		I.	Tr.	Eg.
25	0	33		II.	Sh.	Eg.
	1	8		II.	Tr.	Eg.
	14	25	54.5	IV.*	Ec.	Dis.
	17	59	37.2	I.	Ec.	Dis.
	20	32		I.	Oc.	Re.
	20	43		IV.	Oc.	Re.
26	15	10		I.*	Sh.	In.
	15	26		I.*	Tr.	In.
	16	16	18.7	II.*	Ec.	Dis.
	17	29		I.	Sh.	Eg.
	17	44		I.	Tr.	Eg.
	18	48		III.	Sh.	In.
	19	34		II.	Oc.	Re.
	19	53		III.	Tr.	In.
	22	16		III.	Sh.	Eg.
	23	10		III.	Tr.	Eg.
27	12	28	19.2	I.*	Ec.	Dis.
	14	58		I.*	Oc.	Re.
28	9	39		I.*	Sh.	In.
	9	52		I.*	Tr.	In.
	10	59		II.*	Sh.	In.
	11	25		II.*	Tr.	In.
	11	58		I.*	Sh.	Eg.
	12	10		I.*	Tr.	Eg.
	13	52		II.*	Sh.	Eg.
	14	16		II.*	Tr.	Eg.
29	6	57	7.8	I.	Ec.	Dis.
	9	24		I.*	Oc.	Re.
30	4	7		I.	Sh.	In.
	4	18		I.	Tr.	In.
	5	33	50.5	II.	Ec.	Dis.
	6	26		I.	Sh.	Eg.
	6	36		I.	Tr.	Eg.
	8	41		II.*	Oc.	Re.
	8	50	57.1	III.*	Ec.	Dis.
	12	45		III.*	Oc.	Re.
31	1	25	48.8	I.	Ec.	Dis.
	3	50		I.	Oc.	Re.
	22	36		I.	Sh.	In.
	22	44		I.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

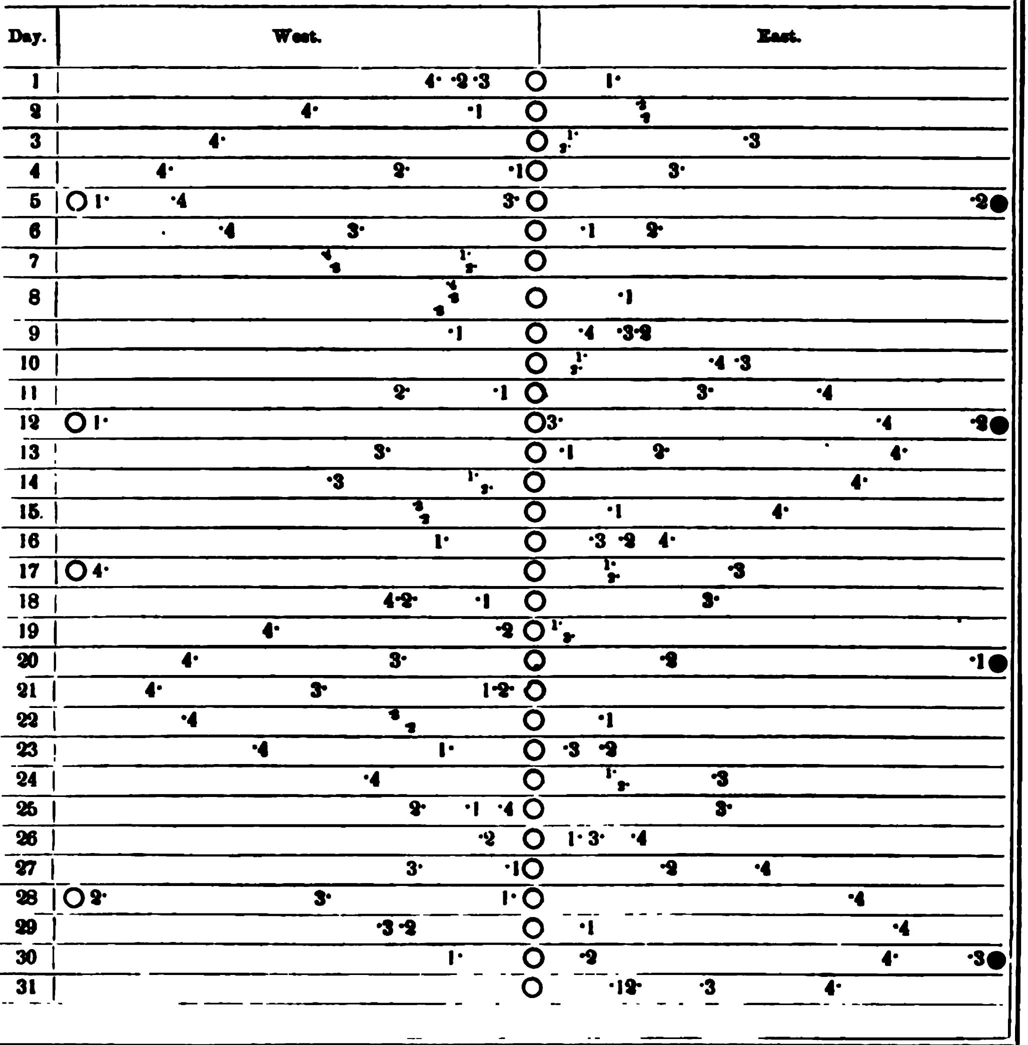
WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s			
1	0	19		II.	Sh.	In.
	0	33		II.	Tr.	In.
	0	55		I.	Sh.	Eg.
	1	2		I.	Tr.	Eg.
	3	12		II.	Sh.	Eg.
	3	24		II.	Tr.	Eg.
	19	54	37.6	I.	Ec.	Dis.
	22	16		I.	Oc.	Re.
2	17	5		I.	Sh.	In.
	17	9		I.	Tr.	In.
	18	51	25.6	II.	Ec.	Dis.
	19	24		I.	Sh.	Eg.
	19	27		I.	Tr.	Eg.
	21	47		II.	Oc.	Re.
	22	49		III.	Sh.	In.
	23	8		III.	Tr.	In.
3	1	3		IV.	Sh.	In.
	1	52		IV.	Tr.	In.
	2	16		III.	Sh.	Eg.
	2	26		III.	Tr.	Eg.
	5	12		IV.	Sh.	Eg.
	5	25		IV.	Tr.	Eg.
	14	23	21.4	I.*	Ec.	Dis.
	16	42		I.	Oc.	Re.
4	11	33		I.*	Sh.	In.
	11	35		I.*	Tr.	In.
	13	38		II.*	Sh.	In.
	13	41		II.*	Tr.	In.
	13	52		I.*	Sh.	Eg.
	13	53		I.*	Tr.	Eg.
	16	31		II.	Sh.	Eg.
	16	32		II.	Tr.	Eg.
5	8	50		I.*	Oc.	Dis.
	11	8		I.*	Oc.	Re.
6	6	1		I.	Tr.	In.
	6	2		I.	Sh.	In.
	8	3		II.*	Oc.	Dis.
	8	19		I.*	Tr.	Eg.
	8	21		I.*	Sh.	Eg.
	10	55	14.4	II.*	Ec.	Re.
	12	43		III.*	Oc.	Dis.
	16	9	31.1	III.	Ec.	Re.
7	3	16		I.	Oc.	Dis.
	5	35	19.5	I.	Ec.	Re.
8	0	27		I.	Tr.	In.
	0	31		I.	Sh.	In.
	2	45		I.	Tr.	Eg.
	2	49		II.	Tr.	In.
	2	50		I.	Sh.	Eg.
	2	57		II.	Sh.	In.
	5	40		II.	Tr.	Eg.
	5	50		II.	Sh.	Eg.
	21	42		I.	Oc.	Dis.
9	0	4	8.4	I.	Ec.	Re.
	18	53		I.	Tr.	In.
	18	59		I.	Sh.	In.
	21	9		II.	Oc.	Dis.
	21	11		I.	Tr.	Eg.
	21	18		I.	Sh.	Eg.
10	0	12	49.7	II.	Ec.	Re.
	2	23		III.	Tr.	In.
	2	51		III.	Sh.	In.
	5	42		III.	Tr.	Eg.
	6	17		III.	Sh.	Eg.
10	16	8		I.	Oc.	Dis.
	18	32	52.7	I.	Ec.	Re.
11	7	16		IV.*	Oc.	Dis.
	12	30	27.6	IV.*	Ec.	Re.
	13	18		I.*	Tr.	In.
	13	28		I.*	Sh.	In.
	15	36		I.*	Tr.	Eg.
	15	47		I.*	Sh.	Eg.
	15	57		II.*	Tr.	In.
	16	16		II.	Sh.	In.
	18	48		II.	Tr.	Eg.
	19	9		II.	Sh.	Eg.
12	10	34		I.*	Oc.	Dis.
	13	1	43.1	I.*	Ec.	Re.
13	7	44		I.*	Tr.	In.
	7	57		I.*	Sh.	In.
	10	2		I.*	Tr.	Eg.
	10	16		I.*	Sh.	Eg.
	10	16		II.*	Oc.	Dis.
	13	30	26.4	II.*	Ec.	Re.
	15	58		III.*	Oc.	Dis.
	20	10	26.0	III.	Ec.	Re.
14	5	0		I.	Oc.	Dis.
	7	30	26.1	I.*	Ec.	Re.
15	2	10		I.	Tr.	In.
	2	25		I.	Sh.	In.
	4	28		I.	Tr.	Eg.
	4	44		I.	Sh.	Eg.
	5	5		II.	Tr.	In.
	5	35		II.	Sh.	In.
	7	56		II.*	Tr.	Eg.
	8	28		II.*	Sh.	Eg.
	23	26		I.	Oc.	Dis.
16	1	59	16.7	I.	Ec.	Re.
	20	36		I.	Tr.	In.
	20	54		I.	Sh.	In.
	22	54		I.	Tr.	Eg.
	23	13		I.	Sh.	Eg.
	23	23		II.	Oc.	Dis.
17	2	48	7.6	II.	Ec.	Re.
	5	39		III.	Tr.	In.
	6	52		III.*	Sh.	In.
	8	59		III.*	Tr.	Eg.
	10	18		III.*	Sh.	Eg.
	17	52		I.	Oc.	Dis.
	20	28	2.4	I.	Ec.	Re.
18	15	2		I.*	Tr.	In.
	15	23		I.*	Sh.	In.
	17	20		I.	Tr.	Eg.
	17	42		I.	Sh.	Eg.
	18	13		II.	Tr.	In.
	18	54		II.	Sh.	In.
	21	4		II.	Tr.	Eg.
	21	47		II.	Sh.	Eg.
19	12	18		I.*	Oc.	Dis.
	14	56	54.6	I.*	Ec.	Re.
	16	2		IV.	Tr.	In.
	19	21		IV.	Sh.	In.
	19	44		IV.	Tr.	Eg.
	23	22		IV.	Sh.	Eg.
20	9	28		I.*	Tr.	In.
	9	51		I.*	Sh.	In.
	11	46		I.*	Tr.	Eg.
20	12	10		I.*	Sh.	Eg.
	12	30		II.*	Oc.	Dis.
	16	5	50.5	II.	Ec.	Re.
	19	15		III.	Oc.	Dis.
21	0	11	27.9	III.	Ec.	Re.
	6	45		I.*	Oc.	Dis.
	9	25	39.2	I.*	Ec.	Re.
22	3	54		I.	Tr.	In.
	4	20		I.	Sh.	In.
	6	12		I.	Tr.	Eg.
	6	39		I.*	Sh.	Eg.
	7	22		II.*	Tr.	In.
	8	14		II.*	Sh.	In.
	10	13		II.*	Tr.	Eg.
	11	6		II.*	Sh.	Eg.
23	1	11		I.	Oc.	Dis.
	3	54	31.2	I.	Ec.	Re.
	22	20		I.	Tr.	In.
	22	49		I.	Sh.	In.
24	0	38		I.	Tr.	Eg.
	1	8		I.	Sh.	Eg.
	1	38		II.	Oc.	Dis.
	5	23	37.8	II.	Ec.	Re.
	8	57		III.*	Tr.	In.
	10	55		III.*	Sh.	In.
	12	19		III.*	Tr.	Eg.
	14	20		III.*	Sh.	Eg.
	19	37		I.	Oc.	Dis.
	22	23	18.6	I.	Ec.	Re.
25	16	47		I.	Tr.	In.
	17	18		I.	Sh.	In.
	19	5		I.	Tr.	Eg.
	19	37		I.	Sh.	Eg.
	20	31		II.	Tr.	In.
	21	33		II.	Sh.	In.
	23	23		II.	Tr.	Eg.
26	0	25		II.	Sh.	Eg.
	14	3		I.*	Oc.	Dis.
	16	52	12.2	I.	Ec.	Re.
27	11	13		I.*	Tr.	In.
	11	46		I.*	Sh.	In.
	13	31		I.*	Tr.	Eg.
	14	5		I.*	Sh.	Eg.
	14	46		II.*	Oc.	Dis.
	18	41	27.4	II.	Ec.	Re.
	21	30		IV.	Oc.	Dis.
	22	34		III.	Oc.	Dis.
28	1	18		IV.	Oc.	Re.
	2	59	11.0	IV.	Ec.	Dis.
	4	12	15.0	III.	Ec.	Re.
	6	40	36.2	IV.*	Ec.	Re.
	8	30		I.*	Oc.	Dis.
	11	20	58.5	I.*	Ec.	Re.
29	5	39		I.	Tr.	In.
	6	15		I.	Sh.	In.
	7	57		I.*	Tr.	Eg.
	8	34		I.*	Sh.	Eg.
	9	40		II.*	Tr.	In.
	10	52		II.*	Sh.	In.
	12	32		II.*	Tr.	Eg.
	13	44		II.*	Sh.	Eg.
30	2	56		I.	Oc.	Dis.
	5	49	51.7	I.	Ec.	Re.

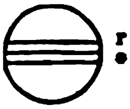
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

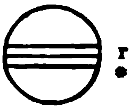
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

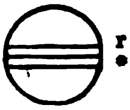
I.



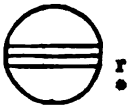
III.



II.



IV.



Configurations at 11ʰ for an Inverting Telescope.

Day.	West.		East.
1	2· ·1	○	3· 4·
2	·2	○	1· 4· 3·
3	3· 4· ·1	○	·2
4	○ 1· 3· 4·	○	2·
5	4· ·3 ·2	○	·1 ●
6	4· 1· ·3	○	·2
7	·4	○	·1 2· ·3
8	·4 1· 2·	○	3·
9	·4 ·2	○	1· 3·
10	·4 1 2·	○	·3
11	3·	○	1· 2· ·4 ●
12	·3 2·	○	·4 ·1 ●
13	·31·	○	·4 ·2 ●
14		○	·1 3 2· ·4
15	1· 2·	○	·3 ·4
16	·2	○	·1 3· 4·
17	·1 3·	○	·2 4·
18	3·	○	1·2· 4·
19	·3 2· ·1	○	4·
20	○ 1· 4· ·3 ·2	○	
21	4·	○	·1 ·3 ·2
22	4· 1· 2·	○	·3
23	4· ·2	○	·1 3·
24	○ 3· ·4 ·1	○	·2
25	·4 3·	○	1· 2·
26	·4 3 2· ·1	○	
27	·3 ·4 ·2	○	1·
28		○	·1 ·4 3 ·2
29	○ 2· 1·	○	·4 3
30	·2	○	·1 3· ·4

WASHINGTON MEAN TIME.

OCTOBER.

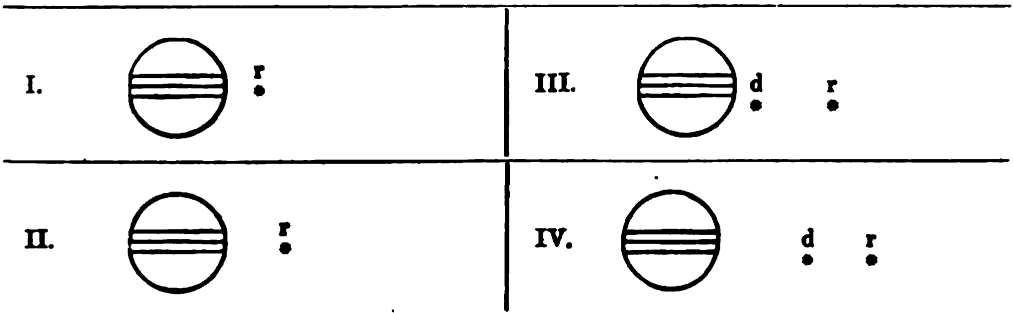
d	h	m	s			
1	0	5		I.	Tr.	In.
	0	44		I.	Sh.	In.
	2	23		I.	Tr.	Eg.
	3	2		I.	Sh.	Eg.
	3	54		II.	Oc.	Dis.
	7	59	20.7	II. *	Ec.	Re.
	12	17		III. *	Tr.	In.
	14	57		III.	Sh.	In.
	15	40		III.	Tr.	Eg.
	18	21		III.	Sh.	Eg.
	21	23		I.	Oc.	Dis.
2	0	18	40.3	I.	Ec.	Re.
	18	31		I.	Tr.	In.
	19	12		I.	Sh.	In.
	20	49		I.	Tr.	Eg.
	21	30		I.	Sh.	Eg.
	22	50		II.	Tr.	In.
3	0	11		II.	Sh.	In.
	1	42		II.	Tr.	Eg.
	3	3		II.	Sh.	Eg.
	15	49		I.	Oc.	Dis.
	18	47	35.0	I.	Ec.	Re.
4	12	58		I. *	Tr.	In.
	13	41		I. *	Sh.	In.
	15	16		I.	Tr.	Eg.
	15	59		I.	Sh.	Eg.
	17	2		II.	Oc.	Dis.
	21	17	17.1	II.	Ec.	Re.
5	1	56		III.	Oc.	Dis.
	8	13	9.6	III. *	Ec.	Re.
	10	16		I. *	Oc.	Dis.
	13	16	22.7	I. *	Ec.	Re.
6	6	37		IV. *	Tr.	In.
	7	25		I. *	Tr.	In.
	8	10		I. *	Sh.	In.
	9	43		I. *	Tr.	Eg.
	10	28		I. *	Sh.	Eg.
	10	30		IV. *	Tr.	Eg.
	12	0		II. *	Tr.	In.
	13	30		II. *	Sh.	In.
	13	40		IV. *	Sh.	In.
	14	52		II.	Tr.	Eg.
	16	22		II.	Sh.	Eg.
	17	34		IV.	Sh.	Eg.
7	4	42		I.	Oc.	Dis.
	7	45	17.0	I. *	Ec.	Re.
8	1	51		I.	Tr.	In.
	2	39		I.	Sh.	In.
	4	9		I.	Tr.	Eg.
	4	57		I.	Sh.	Eg.
	6	11		II. *	Oc.	Dis.
	10	35	16.1	II. *	Ec.	Re.
	15	41		III.	Tr.	In.
	18	58		III.	Sh.	In.
	19	5		III.	Tr.	Eg.
	22	22		III.	Sh.	Eg.
	23	9		I.	Oc.	Dis.
9	2	14	6.6	I.	Ec.	Re.
	20	18		I.	Tr.	In.
	21	8		I.	Sh.	In.
	22	36		I.	Tr.	Eg.
	23	26		I.	Sh.	Eg.
10	1	10		II.	Tr.	In.
	2	49		II.	Sh.	In.
	4	2		II.	Tr.	Eg.
	5	41		II.	Sh.	Eg.
	17	36		I.	Oc.	Dis.
	20	43	2.5	I.	Ec.	Re.
11	14	45		I.	Tr.	In.
	15	36		I.	Sh.	In.
	17	3		I.	Tr.	Eg.
11	17	54		I.	Sh.	Eg.
	19	21		II.	Oc.	Dis.
	23	53	20.4	II.	Ec.	Re.
12	5	22		III.	Oc.	Dis.
	8	47		III. *	Oc.	Re.
	9	2	45.7	III. *	Ec.	Dis.
	12	2		I. *	Oc.	Dis.
	12	14	34.3	III. *	Ec.	Re.
	15	11	51.3	I.	Ec.	Re.
13	9	11		I. *	Tr.	In.
	10	5		I. *	Sh.	In.
	11	29		I. *	Tr.	Eg.
	12	23		I. *	Sh.	Eg.
	14	20		II.	Tr.	In.
	16	9		II.	Sh.	In.
	17	13		II.	Tr.	Eg.
	19	1		II.	Sh.	Eg.
14	6	29		I. *	Oc.	Dis.
	9	40	46.4	I. *	Ec.	Re.
	12	22		IV. *	Oc.	Dis.
	16	20		IV.	Oc.	Re.
	21	17	35.1	IV.	Ec.	Dis.
15	0	51	5.5	IV.	Ec.	Re.
	3	38		I.	Tr.	In.
	4	34		I.	Sh.	In.
	5	56		I.	Tr.	Eg.
	6	52		I. *	Sh.	Eg.
	8	31		II. *	Oc.	Dis.
	13	11	25.4	II. *	Ec.	Re.
	19	9		III.	Tr.	In.
	22	34		III.	Tr.	Eg.
	23	0		III.	Sh.	In.
16	0	56		I.	Oc.	Dis.
	2	22		III.	Sh.	Eg.
	4	9	37.0	I.	Ec.	Re.
	22	5		I.	Tr.	In.
	23	3		I.	Sh.	In.
17	0	23		I.	Tr.	Eg.
	1	21		I.	Sh.	Eg.
	3	31		II.	Tr.	In.
	5	28		II.	Sh.	In.
	6	24		II. *	Tr.	Eg.
	8	20		II. *	Sh.	Eg.
	19	23		I.	Oc.	Dis.
	22	38	34.0	I.	Ec.	Re.
18	16	32		I.	Tr.	In.
	17	32		I.	Sh.	In.
	18	50		I.	Tr.	Eg.
	19	50		I.	Sh.	Eg.
	21	41		II.	Oc.	Dis.
19	2	29	36.6	II.	Ec.	Re.
	8	53		III. *	Oc.	Dis.
	12	18		III.	Oc.	Re.
	13	5	8.6	III.	Ec.	Dis.
	13	50		I.	Oc.	Dis.
	16	15	59.8	III.	Ec.	Re.
	17	7	23.9	I.	Ec.	Re.
20	10	59		I. *	Tr.	In.
	12	1		I. *	Sh.	In.
	13	18		I. *	Tr.	Eg.
	14	19		I.	Sh.	Eg.
	16	43		II.	Tr.	In.
	18	47		II.	Sh.	In.
	19	36		II.	Tr.	Eg.
	21	38		II.	Sh.	Eg.
21	8	18		I. *	Oc.	Dis.
	11	36	20.0	I. *	Ec.	Re.
22	5	26		I.	Tr.	In.
	6	29		I. *	Sh.	In.
	7	45		I. *	Tr.	Eg.
22	8	47		I. *	Sh.	Eg.
	10	53		II. *	Oc.	Dis.
	15	47	47.3	II.	Ec.	Re.
	21	59		IV.	Tr.	In.
	22	41		III.	Tr.	In.
23	2	0		IV.	Tr.	Eg.
	2	7		III.	Tr.	Eg.
	2	45		I.	Oc.	Dis.
	3	2		III.	Sh.	In.
	6	5	11.6	I. *	Ec.	Re.
	6	23		III. *	Sh.	Eg.
	8	0		IV. *	Sh.	In.
	11	46		IV. *	Sh.	Eg.
	23	53		I.	Tr.	In.
24	0	58		I.	Sh.	In.
	2	12		I.	Tr.	Eg.
	3	16		I.	Sh.	Eg.
	5	56		II.	Tr.	In.
	8	6		II. *	Sh.	In.
	8	49		II. *	Tr.	Eg.
	10	57		II. *	Sh.	Eg.
	21	12		I.	Oc.	Dis.
25	0	34	9.1	I.	Ec.	Re.
	18	20		I.	Tr.	In.
	19	27		I.	Sh.	In.
	20	39		I.	Tr.	Eg.
	21	45		I.	Sh.	Eg.
26	0	5		II.	Oc.	Dis.
	5	6	6.0	II.	Ec.	Re.
	12	29		III.	Oc.	Dis.
	15	40		I.	Oc.	Dis.
	15	55		III.	Oc.	Re.
	17	8	11.0	III.	Ec.	Dis.
	19	2	59.9	I.	Ec.	Re.
	20	18	3.4	III.	Ec.	Re.
27	12	48		I. *	Tr.	In.
	13	56		I. *	Sh.	In.
	15	6		I.	Tr.	Eg.
	16	14		I.	Sh.	Eg.
	19	9		II.	Tr.	In.
	21	25		II.	Sh.	In.
	22	2		II.	Tr.	Eg.
28	0	16		II.	Sh.	Eg.
	10	7		I. *	Oc.	Dis.
	13	31	56.4	I. *	Ec.	Re.
29	7	16		I. *	Tr.	In.
	8	25		I. *	Sh.	In.
	9	35		I. *	Tr.	Eg.
	10	43		I. *	Sh.	Eg.
	13	17		II. *	Oc.	Dis.
	18	24	21.4	II.	Ec.	Re.
30	2	19		III.	Tr.	In.
	4	35		I.	Oc.	Dis.
	5	46		III.	Tr.	Eg.
	7	5		III. *	Sh.	In.
	8	0	48.6	I. *	Ec.	Re.
	10	25		III. *	Sh.	Eg.
31	1	43		I.	Tr.	In.
	2	54		I.	Sh.	In.
	4	2		I.	Tr.	Eg.
	4	13		IV.	Oc.	Dis.
	5	12		I.	Sh.	Eg.
	8	17		IV. *	Oc.	Re.
	8	23		II. *	Tr.	In.
	10	44		II. *	Sh.	In.
	11	16		II. *	Tr.	Eg.
	13	35		II. *	Sh.	Eg.
	15	36	38.5	IV.	Ec.	Dis.
	19	1	42.5	IV.	Ec.	Re.
	23	1		I.	Oc.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

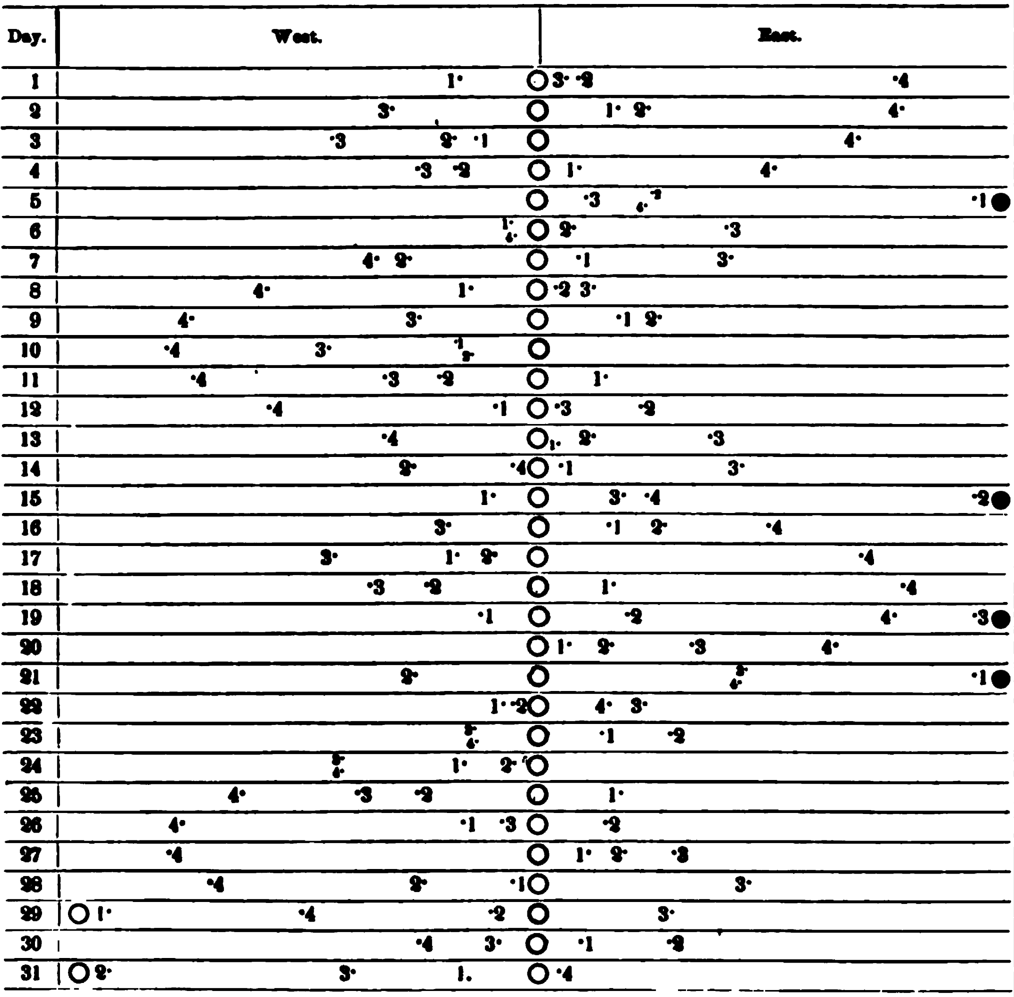
WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s			
1	2	29	46.6	I.	Ec.	Re.
	20	10		I.	Tr.	In.
	21	22		I.	Sh.	In.
	22	29		I.	Tr.	Eg.
	23	40		I.	Sh.	Eg.
2	2	31		II.	Oc.	Dis.
	7	42	47.6	II. *	Ec.	Re.
	16	9		III.	Oc.	Dis.
	17	30		I.	Oc.	Dis.
	19	36		III.	Oc.	Re.
	20	58	38.8	I.	Ec.	Re.
	21	10	40.4	III.	Ec.	Dis.
3	0	19	32.8	III.	Ec.	Re.
	14	38		I.	Tr.	In.
	15	51		I.	Sh.	In.
	16	57		I.	Tr.	Eg.
	18	9		I.	Sh.	Eg.
	21	37		II.	Tr.	In.
4	0	3		II.	Sh.	In.
	0	30		II.	Tr.	Eg.
	2	54		II.	Sh.	Eg.
	11	58		I. *	Oc.	Dis.
	15	27	34.5	I.	Ec.	Re.
5	9	6		I. *	Tr.	In.
	10	20		I. *	Sh.	In.
	11	25		I. *	Tr.	Eg.
	12	38		I.	Sh.	Eg.
	15	44		II.	Oc.	Dis.
	21	1	7.4	II.	Ec.	Re.
6	6	3		III. *	Tr.	In.
	6	26		I. *	Oc.	Dis.
	9	30		III. *	Tr.	Eg.
	9	56	27.2	I. *	Ec.	Re.
	11	7		III. *	Sh.	In.
	14	27		III.	Sh.	Eg.
7	3	34		I.	Tr.	In.
	4	49		I.	Sh.	In.
	5	53		I. *	Tr.	Eg.
	7	7		I. *	Sh.	Eg.
	10	52		II. *	Tr.	In.
	13	22		II.	Sh.	In.
	13	45		II.	Tr.	Eg.
	16	13		II.	Sh.	Eg.
8	0	54		I.	Oc.	Dis.
	4	25	25.5	I.	Ec.	Re.
	14	21		IV.	Tr.	In.
	18	29		IV.	Tr.	Eg.
	22	2		I.	Tr.	In.
	23	18		I.	Sh.	In.
9	0	21		I.	Tr.	Eg.
	1	36		I.	Sh.	Eg.
	2	20		IV.	Sh.	In.
	4	59		II.	Oc.	Dis.
	5	58		IV. *	Sh.	Eg.
	10	19	41.0	II. *	Ec.	Re.
	19	22		I.	Oc.	Dis.
	19	54		III.	Oc.	Dis.
	22	54	17.2	I.	Ec.	Re.
	23	22		III.	Oc.	Re.
10	1	13	11.5	III.	Ec.	Dis.
	4	21	2.7	III.	Ec.	Re.
	16	30		I.	Tr.	In.
	17	47		I.	Sh.	In.
	18	49		I.	Tr.	Eg.
	20	5		I.	Sh.	Eg.

d	h	m	s			
11	0	7		II.	Tr.	In.
	2	41		II.	Sh.	In.
	3	0		II.	Tr.	Eg.
	5	32		II. *	Sh.	Eg.
	13	50		I.	Oc.	Dis.
	17	23	13.9	I.	Ec.	Re.
12	10	58		I. *	Tr.	In.
	12	16		I. *	Sh.	In.
	13	17		I.	Tr.	Eg.
	14	34		I.	Sh.	Eg.
	18	14		II.	Oc.	Dis.
	23	38	5.1	II.	Ec.	Re.
13	8	18		I. *	Oc.	Dis.
	9	52		III. *	Tr.	In.
	11	52	6.8	I. *	Ec.	Re.
	13	19		III.	Tr.	Eg.
	15	11		III.	Sh.	In.
	18	29		III.	Sh.	Eg.
14	5	26		I. *	Tr.	In.
	6	45		I. *	Sh.	In.
	7	45		I. *	Tr.	Eg.
	9	3		I. *	Sh.	Eg.
	13	23		II.	Tr.	In.
	16	0		II.	Sh.	In.
	16	16		II.	Tr.	Eg.
	18	51		II.	Sh.	Eg.
15	2	47		I.	Oc.	Dis.
	6	21	5.1	I. *	Ec.	Re.
	23	55		I.	Tr.	In.
16	1	14		I.	Sh.	In.
	2	14		I.	Tr.	Eg.
	3	32		I.	Sh.	Eg.
	7	30		II. *	Oc.	Dis.
	12	56	46.0	II.	Ec.	Re.
	21	6		IV.	Oc.	Dis.
	21	15		I.	Oc.	Dis.
	23	45		III.	Oc.	Dis.
17	0	49	56.8	I.	Ec.	Re.
	1	15		IV.	Oc.	Re.
	3	13		III.	Oc.	Re.
	5	15	25.9	III.	Ec.	Dis.
	8	22	14.9	III. *	Ec.	Re.
	9	56	48.4	IV. *	Ec.	Dis.
	13	12	47.2	IV.	Ec.	Re.
	18	23		I.	Tr.	In.
	19	43		I.	Sh.	In.
	20	42		I.	Tr.	Eg.
	22	1		I.	Sh.	Eg.
18	2	39		II.	Tr.	In.
	5	19		II. *	Sh.	In.
	5	32		II. *	Tr.	Eg.
	8	10		II. *	Sh.	Eg.
	15	43		I.	Oc.	Dis.
	19	18	53.4	I.	Ec.	Re.
19	12	52		I.	Tr.	In.
	14	12		I.	Sh.	In.
	15	11		I.	Tr.	Eg.
	16	30		I.	Sh.	Eg.
	20	46		II.	Oc.	Dis.
20	2	15	13.2	II.	Ec.	Re.
	10	12		I. *	Oc.	Dis.
	13	45		III.	Tr.	In.
	13	47	46.3	I.	Ec.	Re.
	17	13		III.	Tr.	Eg.
	19	13		III.	Sh.	In.

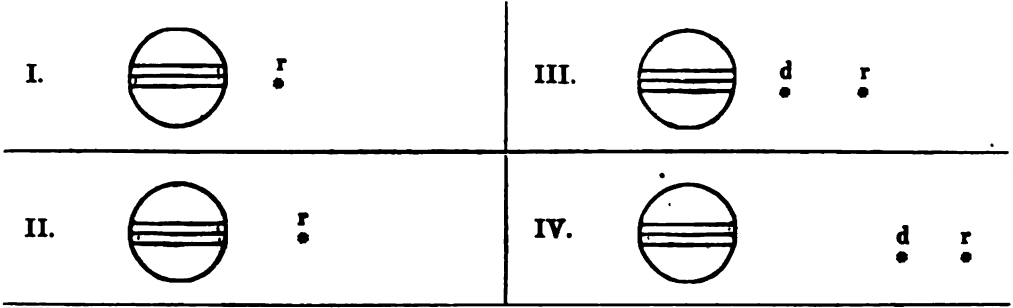
d	h	m	s			
20	22	30		III.	Sh.	Eg.
21	7	20		I. *	Tr.	In.
	8	41		I. *	Sh.	In.
	9	39		I. *	Tr.	Eg.
	10	59		I. *	Sh.	Eg.
	15	56		II.	Tr.	In.
	18	38		II.	Sh.	In.
	18	49		II.	Tr.	Eg.
	21	29		II.	Sh.	Eg.
22	4	40		I.	Oc.	Dis.
	8	16	44.7	I. *	Ec.	Re.
23	1	49		I.	Tr.	In.
	3	10		I.	Sh.	In.
	4	8		I.	Tr.	Eg.
	5	28		I. *	Sh.	Eg.
	10	4		II. *	Oc.	Dis.
	15	34	1.9	II.	Ec.	Re.
	23	9		I.	Oc.	Dis.
24	2	45	36.7	I.	Ec.	Re.
	3	41		III.	Oc.	Dis.
	7	9		III. *	Oc.	Re.
	9	17	44.0	III. *	Ec.	Dis.
	12	23	29.6	III.	Ec.	Re.
	20	17		I.	Tr.	In.
	21	39		I.	Sh.	In.
	22	36		I.	Tr.	Eg.
	23	57		I.	Sh.	Eg.
25	5	13		II.	Tr.	In.
	7	47		IV. *	Tr.	In.
	7	57		II. *	Sh.	In.
	8	6		II. *	Tr.	Eg.
	10	47		II. *	Sh.	Eg.
	11	58		IV. *	Tr.	Eg.
	17	38		I.	Oc.	Dis.
	20	41		IV.	Sh.	In.
	21	14	32.7	I.	Ec.	Re.
26	0	10		IV.	Sh.	Eg.
	14	46		I.	Tr.	In.
	16	7		I.	Sh.	In.
	17	5		I.	Tr.	Eg.
	18	25		I.	Sh.	Eg.
	23	21		II.	Oc.	Dis.
27	4	52	32.6	II.	Ec.	Re.
	12	7		I. *	Oc.	Dis.
	15	43	25.6	I.	Ec.	Re.
	17	42		III.	Tr.	In.
	21	11		III.	Tr.	Eg.
	23	16		III.	Sh.	In.
28	2	32		III.	Sh.	Eg.
	9	15		I. *	Tr.	In.
	10	36		I. *	Sh.	In.
	11	34		I. *	Tr.	Eg.
	12	54		I.	Sh.	Eg.
	18	31		II.	Tr.	In.
	21	16		II.	Sh.	In.
	21	24		II.	Tr.	Eg.
29	0	6		II.	Sh.	Eg.
	6	35		I. *	Oc.	Dis.
	10	12	23.3	I. *	Ec.	Re.
30	3	44		I.	Tr.	In.
	5	5		I.	Sh.	In.
	6	3		I. *	Tr.	Eg.
	7	23		I. *	Sh.	Eg.
	12	40		II.	Oc.	Dis.
	18	11	27.8	II.	Ec.	Re.

NOTE.— In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8h for an Inverting Telescope.

Day.	West.		East.
1	·3 ·2	○	·1 ·4
2	$\substack{3\\ \cdot 1}$	○	·2 ·4
3		○	1· $\substack{2\cdot\\ 3}$ ·4
4	2· ·1	○	3· ·4
5	○ 1· ·2	○	3· 4·
6	○ 3·	○	·2 4· ·1 ●
7	3· 1·	○	2· 4·
8	·3 ·2	○	4· ·1
9	4· $\substack{3\\ 1\cdot}$	○	·2
10	4·	○	$\substack{3\\ 1\cdot}$ 2·
11	4· $\substack{1\\ 2\cdot}$	○	·3
12	4· ·2	○	1· 3·
13	·4 ·1	○	3· ·2
14	·4 3· 1·	○	2·
15	$\substack{\cdot 4\\ 3}$ 2·	○	·1
16	·3 ·41·	○	·2 ●
17		○	$\substack{3\\ \cdot 4}$ ·1 2·
18	·1 2·	○	$\substack{\cdot 4\\ 3}$
19	·2	○	1· 3· ·4
20	·1	○	3· ·2 ·4
21	○ 1· 3·	○	2· 4·
22	3· 2·	○	·1 4·
23	·3 1· ·2	○	4·
24		○	·3 ·1 $\substack{2\\ 4\cdot}$
25	○ 4· 1· 2·	○	·3
26	4· ·2	○	1· 3·
27	4· ·1	○	$\substack{1\\ 2\cdot}$
28	4· 3·	○	1· 2·
29	4· 3· 2·	○	·1 ●
30	·4 ·3 ·21·	○	

WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s			
1	1	4		I.	Oc.	Dis.
	4	41	15.0	I.	Ec.	Re.
	7	41		III.*	Oc.	Dis.
	11	9		III.*	Oc.	Re.
	13	20	29.1	III.	Ec.	Dis.
	16	25	10.9	III.	Ec.	Re.
	22	13		I.	Tr.	In.
	23	34		I.	Sh.	In.
2	0	32		I.	Tr.	Eg.
	1	52		I.	Sh.	Eg.
	7	50		II.*	Tr.	In.
	10	35		II.*	Sh.	In.
	10	43		II.*	Tr.	Eg.
	13	25		II.	Sh.	Eg.
	19	33		I.	Oc.	Dis.
	23	10	10.5	I.	Ec.	Re.
3	15	2		IV.	Oc.	Dis.
	16	42		I.	Tr.	In.
	18	3		I.	Sh.	In.
	19	1		I.	Tr.	Eg.
	19	13		IV.	Oc.	Re.
	20	21		I.	Sh.	Eg.
4	1	58		II.	Oc.	Dis.
	4	17	28.0	IV.	Ec.	Dis.
	7	23	37.2	IV.*	Ec.	Re.
	7	30	1.1	II.*	Ec.	Re.
	14	2		I.	Oc.	Dis.
	17	39	2.7	I.	Ec.	Re.
	21	44		III.	Tr.	In.
5	1	12		III.	Tr.	Eg.
	3	18		III.	Sh.	In.
	6	33		III.*	Sh.	Eg.
	11	11		I.*	Tr.	In.
	12	32		I.	Sh.	In.
	13	30		I.	Tr.	Eg.
	14	50		I.	Sh.	Eg.
	21	9		II.	Tr.	In.
	23	54		II.	Sh.	In.
6	0	2		II.	Tr.	Eg.
	2	44		II.	Sh.	Eg.
	8	32		I.*	Oc.	Dis.
	12	8	0.1	I.	Ec.	Re.
7	5	40		I.*	Tr.	In.
	7	1		I.*	Sh.	In.
	7	59		I.*	Tr.	Eg.
	9	19		I.*	Sh.	Eg.
	15	18		II.	Oc.	Dis.
	20	49	3.0	II.	Ec.	Re.
8	3	1		I.	Oc.	Dis.
	6	36	51.4	I.*	Ec.	Re.
	11	45		III.	Oc.	Dis.
	15	13		III.	Oc.	Re.
	17	23	8.2	III.	Ec.	Dis.
	20	26	45.0	III.	Ec.	Re.
9	0	9		I.	Tr.	In.
	1	30		I.	Sh.	In.
	2	28		I.	Tr.	Eg.
	3	47		I.	Sh.	Eg.
	10	28		II.*	Tr.	In.
	13	12		II.	Sh.	In.
	13	21		II.	Tr.	Eg.
	16	2		II.	Sh.	Eg.
	21	30		I.	Oc.	Dis.
10	1	5	46.2	I.	Ec.	Re.
	18	38		I.	Tr.	In.
	19	59		I.	Sh.	In.
	20	57		I.	Tr.	Eg.
	22	16		I.	Sh.	Eg.
11	4	38		II.	Oc.	Dis.
	10	7	38.3	II.*	Ec.	Re.
11	15	59		I.	Oc.	Dis.
	19	34	37.9	I.	Ec.	Re.
12	1	51		III.	Tr.	In.
	2	12		IV.	Tr.	In.
	5	19		III.*	Tr.	Eg.
	6	22		IV.*	Tr.	Eg.
	7	20		III.*	Sh.	In.
	10	34		III.*	Sh.	Eg.
	13	7		I.	Tr.	In.
	14	28		I.	Sh.	In.
	15	3		IV.	Sh.	In.
	15	26		I.	Tr.	Eg.
	16	45		I.	Sh.	Eg.
	18	22		IV.	Sh.	Eg.
	23	48		II.	Tr.	In.
13	2	31		II.	Sh.	In.
	2	41		II.	Tr.	Eg.
	5	20		II.*	Sh.	Eg.
	10	28		I.*	Oc.	Dis.
	14	3	34.6	I.	Ec.	Re.
14	7	37		I.*	Tr.	In.
	8	57		I.*	Sh.	In.
	9	56		I.*	Tr.	Eg.
	11	14		I.*	Sh.	Eg.
	17	59		II.	Oc.	Dis.
	23	26	46.4	II.	Ec.	Re.
15	4	58		I.	Oc.	Dis.
	8	32	25.5	I.*	Ec.	Re.
	15	54		III.	Oc.	Dis.
	19	22		III.	Oc.	Re.
	21	26	21.0	III.	Ec.	Dis.
16	0	28	51.6	III.	Ec.	Re.
	2	6		I.	Tr.	In.
	3	26		I.	Sh.	In.
	4	25		I.	Tr.	Eg.
	5	43		I.*	Sh.	Eg.
	13	9		II.	Tr.	In.
	15	50		II.	Sh.	In.
	16	2		II.	Tr.	Eg.
	18	39		II.	Sh.	Eg.
	23	27		I.	Oc.	Dis.
17	3	1	19.4	I.	Ec.	Re.
	20	36		I.	Tr.	In.
	21	55		I.	Sh.	In.
	22	55		I.	Tr.	Eg.
18	0	12		I.	Sh.	Eg.
	7	19		II.*	Oc.	Dis.
	12	45	23.5	II.	Ec.	Re.
	17	57		I.	Oc.	Dis.
	21	30	10.6	I.	Ec.	Re.
19	6	2		III.*	Tr.	In.
	9	30		III.*	Tr.	Eg.
	11	23		III.	Sh.	In.
	14	36		III.	Sh.	Eg.
	15	5		I.	Tr.	In.
	16	24		I.	Sh.	In.
	17	24		I.	Tr.	Eg.
	18	41		I.	Sh.	Eg.
20	2	30		II.	Tr.	In.
	5	9		II.*	Sh.	In.
	5	23		II.*	Tr.	Eg.
	7	58		II.*	Sh.	Eg.
	9	55		IV.*	Oc.	Dis.
	12	26		I.	Oc.	Dis.
	14	3		IV.	Oc.	Re.
	15	59	6.2	I.	Ec.	Re.
	22	38	31.9	IV.	Ec.	Dis.
21	1	34	0.1	IV.	Ec.	Re.
	9	35		I.*	Tr.	In.
21	10	53		I.*	Sh.	In.
	11	54		I.	Tr.	Eg.
	13	10		I.	Sh.	Eg.
	20	41		II.	Oc.	Dis.
22	2	4	37.4	II.	Ec.	Re.
	6	56		I.*	Oc.	Dis.
	10	27	56.5	I.*	Ec.	Re.
	20	7		III.	Oc.	Dis.
	23	34		III.	Oc.	Re.
23	1	28	54.6	III.	Ec.	Dis.
	4	5		I.	Tr.	In.
	4	30	17.6	III.	Ec.	Re.
	5	22		I.*	Sh.	In.
	6	24		I.*	Tr.	Eg.
	7	39		I.*	Sh.	Eg.
	15	51		II.	Tr.	In.
	18	27		II.	Sh.	In.
	18	44		II.	Tr.	Eg.
	21	16		II.	Sh.	Eg.
24	1	25		I.	Oc.	Dis.
	4	56	49.5	I.	Ec.	Re.
	22	34		I.	Tr.	In.
	23	51		I.	Sh.	In.
25	0	53		I.	Tr.	Eg.
	2	8		I.	Sh.	Eg.
	10	3		II.*	Oc.	Dis.
	15	23	16.0	II.	Ec.	Re.
	19	55		I.	Oc.	Dis.
	23	25	39.6	I.	Ec.	Re.
26	10	17		III.*	Tr.	In.
	13	44		III.	Tr.	Eg.
	15	27		III.	Sh.	In.
	17	4		I.	Tr.	In.
	18	20		I.	Sh.	In.
	18	38		III.	Sh.	Eg.
	19	23		I.	Tr.	Eg.
	20	37		I.	Sh.	Eg.
27	5	13		II.*	Tr.	In.
	7	46		II.*	Sh.	In.
	8	6		II.*	Tr.	Eg.
	10	35		II.*	Sh.	Eg.
	14	25		I.	Oc.	Dis.
	17	54	34.4	I.	Ec.	Re.
28	11	34		I.	Tr.	In.
	12	48		I.	Sh.	In.
	13	53		I.	Tr.	Eg.
	15	5		I.	Sh.	Eg.
	21	27		IV.	Tr.	In.
	23	26		II.	Oc.	Dis.
29	1	33		IV.	Tr.	Eg.
	4	42	36.4	II.	Ec.	Re.
	8	55		I.*	Oc.	Dis.
	9	25		IV.*	Sh.	In.
	12	23	23.9	I.	Ec.	Re.
	12	33		IV.	Sh.	Eg.
30	0	24		III.	Oc.	Dis.
	3	50		III.	Oc.	Re.
	5	31	24.0	III.*	Ec.	Dis.
	6	4		I.*	Tr.	In.
	7	17		I.*	Sh.	In.
	8	23		I.*	Tr.	Eg.
	8	31	38.4	III.*	Ec.	Re.
	9	34		I.*	Sh.	Eg.
	18	35		II.	Tr.	In.
	21	4		II.	Sh.	In.
	21	28		II.	Tr.	Eg.
	23	53		II.	Sh.	Eg.
31	3	24		I.	Oc.	Dis.
	6	52	15.9	I.*	Ec.	Re.

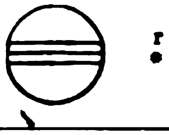
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

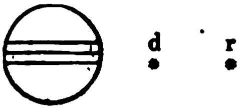
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

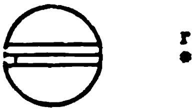
I.



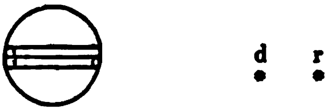
III.



II.

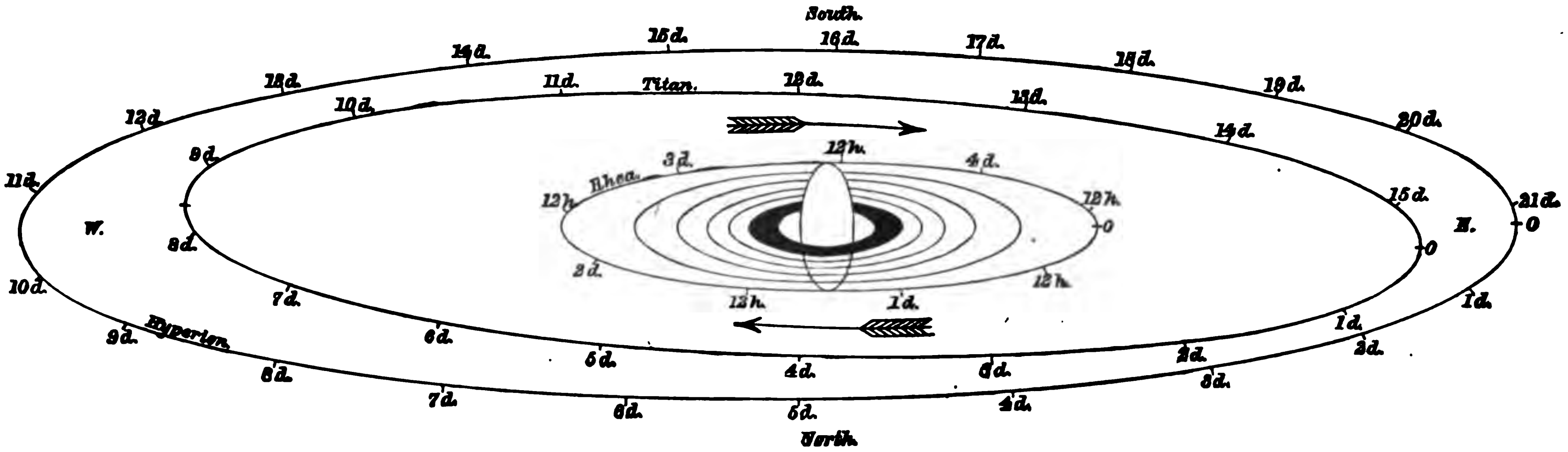


IV.



Configurations at 6h 30m for an Inverting Telescope.

Day.	West.		East.
1	·4 ·3	○	·1 ·2
2	○ 2· ·4 1·	○	·3
3	·2 ·4	○	1· 3·
4	·1	○	·2 ·4 3·
5	3·	○	1· 2· ·4
6	3· 2· ·1	○	·4
7	○ 1· ·3 ·2	○	·4
8	·3	○	·1 ·2 4·
9	1·	○	2· ·3 4·
10	2·	○	·1 ·34·
11	1·	○	4· 3· ·2 ●
12	3· 4·	○	1· 2·
13	3· 4· ·1 2·	○	
14	4· ·3 ·2	○	1·
15	4· ·3	○	·2 ·1 ●
16	4· 1·	○	2· ·3
17	·4 2·	○	·1 ·3
18	·4 1· ·2	○	3·
19	○ 3· ·4	○	1· 2·
20	3· ·1 ·4 2·	○	
21	·3 ·2	○	1· ·4
22	·3 ·1	○	·2 ·4
23	○ 1·	○	·32· ·4
24	2·	○	·1 ·3 ·4
25	1· ·2	○	3· 4·
26		○	3· ·1 ·2 4·
27	○ 2· 3· ·1	○	4·
28	3· ·2	○	1· 4·
29	·3 4··1	○	·2
30	○ 1· 4·	○	·3 2·
31	4· 2·	○	·1 ·3



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

MAY 17, 1891,

AS SEEN IN AN INVERTING TELESCOPE.

(THE VERTICAL SCALE IS TWICE THE HORIZONTAL ONE.)

NAMES OF THE SATELLITES.		MEAN SYNODIC PERIODS.		
			d	h
I.	Mimas.	I.	0	22.6
II.	Enceladus.	II.	1	8.9
III.	Tethys.	III.	1	21.3
IV.	Dione.	IV.	2	17.7
V.	Rhea.	V.	4	12.5
VI.	Titan.	VI.	15	23.3
VII.	Hyperion.	VII.	21	7.8
VIII.	Iapetus.	VIII.	79	22.0

WASHINGTON MEAN TIMES OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction,
W., West Elongation,
S., Superior Conjunction.

MIMAS.

Greatest Elongations Visible at Washington.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	15.3 W.	Jan.	29	10.5 E.	Mar.	1	12.9 E.	Mar.	27	10.9 W.	Apr.	28	11.9 W.	Nov.	24	16.5 W.
	2	13.9 W.		30	9.1 E.		2	11.5 E.		28	9.5 W.		29	10.6 W.		25	15.1 W.
	3	12.5 W.	Feb.	3	14.9 W.		3	10.1 E.		29	8.1 W.		30	9.2 W.	Dec.	1	18.1 E.
	4	11.1 W.		4	13.5 W.		4	8.8 E.	Apr.	1	15.3 E.	May	6	12.2 E.		2	16.8 E.
	8	16.9 E.		5	12.1 W.		8	14.5 W.		2	13.9 E.		7	10.8 E.		3	15.4 E.
	9	15.5 E.		6	10.8 W.		9	13.2 W.		3	12.5 E.		8	9.4 E.		4	14.0 E.
	10	14.1 E.		11	15.2 E.		10	11.8 W.		4	11.2 E.		9	8.0 E.		10	17.0 W.
	11	12.8 E.		12	13.8 E.		11	10.4 W.		5	9.8 E.		15	11.1 W.		11	15.6 W.
	12	11.4 E.		13	12.4 E.		12	9.0 W.		9	15.6 W.		16	9.7 W.		12	14.3 W.
	13	10.0 E.		14	11.0 E.		13	7.6 W.		10	14.2 W.		17	8.3 W.		13	12.8 W.
	16	17.2 W.		15	9.6 E.		16	14.8 E.		11	12.8 W.		24	9.9 E.		18	17.3 E.
	17	15.8 W.		16	8.3 E.		17	13.4 E.		12	11.4 W.		25	8.6 E.		19	15.9 E.
	18	14.4 W.		20	14.0 W.		18	12.0 E.		13	10.0 W.	June	1	10.2 W.		20	14.5 E.
	19	13.0 W.		21	12.6 W.		19	10.7 E.		14	8.7 W.		2	8.8 W.		21	13.1 E.
	20	11.6 W.		22	11.3 W.		20	9.3 E.		18	14.5 E.		9	10.5 E.		25	17.5 W.
	21	10.2 W.		23	9.9 W.		21	7.9 E.		19	13.1 E.		10	9.1 E.		26	16.1 W.
	26	14.6 E.		24	8.5 W.		24	15.1 W.		20	11.7 E.	Nov.	17	14.9 E.		27	14.8 W.
	27	13.3 E.		27	15.7 E.		25	13.7 W.		21	10.3 E.		18	13.5 E.		28	13.4 W.
	28	11.9 E.		28	14.3 E.		26	12.3 W.		27	13.3 W.		23	17.9 W.		29	12.0 W.

ENCELADUS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	7.7 E.	Jan.	15	0.5 E.	Jan.	28	17.3 E.	Feb.	11	10.2 E.	Feb.	25	3.1 E.	Mar.	10	19.9 E.
	2	16.5 E.		16	9.4 E.		30	2.2 E.		12	19.1 E.		26	11.9 E.		12	4.8 E.
	4	1.4 E.		17	18.3 E.		31	11.1 E.		14	4.0 E.		27	20.8 E.		13	13.7 E.
	5	10.3 E.		19	3.2 E.	Feb.	1	20.0 E.		15	12.9 E.	Mar.	1	5.7 E.		14	22.6 E.
	6	19.2 E.		20	12.0 E.		3	4.9 E.		16	21.8 E.		2	14.6 E.		16	7.5 E.
	8	4.1 E.		21	20.9 E.		4	13.8 E.		18	6.7 E.		3	23.5 E.		17	16.3 E.
	9	12.9 E.		23	5.8 E.		5	22.7 E.		19	15.5 E.		5	8.4 E.		19	1.2 E.
	10	21.8 E.		24	14.7 E.		7	7.6 E.		21	0.4 E.		6	17.3 E.		20	10.1 E.
	12	6.7 E.		25	23.6 E.		8	16.4 E.		22	9.3 E.		8	2.1 E.		21	19.0 E.
	13	15.6 E.		27	8.4 E.		10	1.3 E.		23	18.2 E.		9	11.0 E.		23	3.9 E.

WASHINGTON MEAN TIMES OF GREATEST ELONGATION.

ENCELADUS—(*Concluded.*)

	d	h		d	h		d	h		d	h		d	h		d	h
Mar.	24	12.8 E.	Apr.	14	2.0 E.	May	4	15.3 E.	Nov.	1	13.1 E.	Nov.	22	2.4 E.	Dec.	12	15.6 E.
	25	21.6 E.		15	10.9 E.		6	0.2 E.		2	22.0 E.		23	11.3 E.		14	0.5 E.
	27	6.5 E.		16	19.8 E.		7	9.1 E.		4	6.8 E.		24	20.1 E.		15	9.4 E.
	28	15.4 E.		18	4.7 E.		8	18.0 E.		5	15.7 E.		26	5.0 E.		16	18.3 E.
	30	0.3 E.		19	13.6 E.		10	2.8 E.		7	0.6 E.		27	13.9 E.		18	3.2 E.
	31	9.2 E.		20	22.5 E.		11	11.7 E.		8	9.5 E.		28	22.8 E.		19	12.1 E.
Apr.	1	18.1 E.		22	7.4 E.		12	20.6 E.		9	18.4 E.		30	7.7 E.		20	21.0 E.
	3	3.0 E.		23	16.2 E.		14	5.5 E.		11	3.3 E.	Dec.	1	16.6 E.		22	5.8 E.
	4	11.8 E.		25	1.1 E.		15	14.4 E.		12	12.2 E.		3	1.4 E.		23	14.7 E.
	5	20.7 E.		26	10.0 E.		16	23.3 E.		13	21.0 E.		4	10.3 E.		24	23.6 E.
	7	5.6 E.		27	18.9 E.		18	8.1 E.		15	5.9 E.		5	19.2 E.		26	8.5 E.
	8	14.5 E.		29	3.8 E.		19	17.0 E.		16	14.8 E.		7	4.1 E.		27	17.4 E.
	9	23.4 E.		30	12.7 E.		21	1.9 E.		17	23.7 E.		8	13.0 E.		29	2.3 E.
	11	8.3 E.	May	1	21.5 E.		22	10.8 E.		19	8.6 E.		9	21.9 E.		30	11.1 E.
	12	17.2 E.		3	6.4 E.		23	19.7 E.		20	17.5 E.		11	6.8 E.		31	20.0 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	12.7 E.	Feb.	8	6.6 E.	Mar.	18	0.5 E.	Apr.	24	18.5 E.	June	1	12.4 E.	Nov.	26	1.4 E.
	3	9.9 E.		10	3.9 E.		19	21.8 E.		26	15.8 E.		3	9.7 E.		27	22.7 E.
	5	7.2 E.		12	1.2 E.		21	19.1 E.		28	13.1 E.		5	7.0 E.		29	20.0 E.
	7	4.5 E.		13	22.5 E.		23	16.4 E.		30	10.4 E.		7	4.3 E.	Dec.	1	17.3 E.
	9	1.8 E.		15	19.8 E.		25	13.7 E.	May	2	7.7 E.		9	1.6 E.		3	14.6 E.
	10	23.1 E.		17	17.1 E.		27	11.0 E.		4	5.0 E.		10	22.9 E.		5	11.9 E.
	12	20.5 E.		19	14.4 E.		29	8.3 E.		6	2.3 E.		12	20.2 E.		7	9.2 E.
	14	17.7 E.		21	11.7 E.		31	5.6 E.		7	23.6 E.		14	17.5 E.		9	6.5 E.
	16	15.0 E.		23	8.9 E.	Apr.	2	2.9 E.		9	20.9 E.		16	14.8 E.		11	3.8 E.
	18	12.3 E.		25	6.3 E.		4	0.2 E.		11	18.2 E.		18	12.1 E.		13	1.1 E.
	20	9.6 E.		27	3.6 E.		5	21.5 E.		13	15.4 E.		20	9.4 E.		14	22.4 E.
	22	6.9 E.	Mar.	1	0.9 E.		7	18.8 E.		15	12.7 E.		22	6.7 E.		16	19.7 E.
	24	4.2 E.		2	22.2 E.		9	16.1 E.		17	10.0 E.	Nov.	10	22.9 E.		18	17.0 E.
	26	1.5 E.		4	19.5 E.		11	13.4 E.		19	7.3 E.		12	20.2 E.		20	14.3 E.
	27	22.8 E.		6	16.8 E.		13	10.7 E.		21	4.6 E.		14	17.5 E.		22	11.6 E.
	29	20.1 E.		8	14.1 E.		15	8.0 E.		23	1.9 E.		16	14.8 E.		24	8.9 E.
	31	17.4 E.		10	11.4 E.		17	5.3 E.		24	23.2 E.		18	12.1 E.		26	6.3 E.
Feb.	2	14.7 E.		12	8.7 E.		19	2.6 E.		26	20.5 E.		20	9.4 E.		28	3.6 E.
	4	12.0 E.		14	5.9 E.		20	23.9 E.		28	17.8 E.		22	6.7 E.		30	0.9 E.
	6	9.3 E.		16	3.2 E.		22	21.2 E.		30	15.1 E.		24	4.1 E.		31	22.2 E.

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	3	1.0 E.	Feb.	4	20.9 E.	Mar.	9	16.9 E.	Apr.	11	12.8 E.	May	14	8.7 E.	Nov.	30	6.8 E.
	5	18.7 E.		7	14.6 E.		12	10.5 E.		14	6.4 E.		17	2.3 E.	Dec.	3	0.5 E.
	8	12.4 E.		10	8.3 E.		15	4.2 E.		17	0.1 E.		19	20.0 E.		5	18.1 E.
	11	6.0 E.		13	1.9 E.		17	21.8 E.		19	17.7 E.		22	13.7 E.		8	11.8 E.
	13	23.7 E.		15	19.6 E.		20	15.5 E.		22	11.4 E.		25	7.3 E.		11	5.5 E.
	16	17.3 E.		18	13.2 E.		23	9.1 E.		25	5.1 E.		28	1.0 E.		13	23.2 E.
	19	11.0 E.		21	6.9 E.		26	2.8 E.		27	22.7 E.		30	18.6 E.		16	16.8 E.
	22	4.6 E.		24	0.6 E.		28	20.5 E.		30	16.4 E.	Nov.	16	14.5 E.		19	10.5 E.
	24	22.3 E.		26	18.2 E.		31	14.1 E.	May	3	10.0 E.		19	8.1 E.		22	4.2 E.
	27	16.0 E.	Mar.	1	11.9 E.	Apr.	3	7.8 E.		6	3.7 E.		22	1.8 E.		24	21.9 E.
	30	9.6 E.		4	5.5 E.		6	1.4 E.		8	21.4 E.		24	19.5 E.		27	15.5 E.
Feb.	2	3.3 E.		6	23.2 E.		8	19.1 E.		11	15.0 E.		27	13.1 E.		30	9.2 E.

RHEA.				TITAN.				HYPERION.			
d	h	d	h	d	h	d	h	d	h	d	h
Jan. 4	13.8 E.	Apr. 22	22.4 E.	Jan. 1	12.5 E.	Apr. 7	0.6 E.	Jan. 4	17.8 W.	May 12	0.4 W.
9	2.2 E.	27	10.8 E.	5	7.8 I.	10	19.1 I.	10	4.6 S.	17	11.7 S.
13	14.5 E.	May 1	23.2 E.	9	9.8 W.	14	20.8 W.	14	14.9 E.	21	22.4 E.
18	2.9 E.	6	11.5 E.	13	13.4 S.	19	0.1 S.	19	16.4 I.	27	0.3 I.
22	15.2 E.	10	23.9 E.	17	11.8 E.	22	22.4 E.	25	23.7 W.	June 2	8.9 W.
27	3.6 E.	15	12.3 E.	21	6.7 I.	26	16.9 I.	31	10.1 S.	7	20.4 S.
31	16.0 E.	20	0.7 E.	25	8.6 W.	30	18.7 W.	Feb. 4	20.2 E.	12	7.2 E.
Feb. 5	4.3 E.	24	13.0 E.	29	12.0 S.	May 4	22.0 S.	9	21.4 I.	17	9.2 I.
9	16.7 E.	29	1.4 E.	Feb. 2	10.5 E.	8	20.3 E.	16	4.6 W.	23	17.9 W.
14	5.0 E.	June 2	13.7 E.	6	5.4 I.	12	14.9 I.	21	14.8 S.	29	5.6 S.
18	17.4 E.	7	2.1 E.	10	7.1 W.	16	16.9 W.	26	0.8 E.	July 3	16.5 E.
23	5.8 E.	11	14.5 E.	14	10.3 S.	20	20.5 S.	Mar. 3	2.0 I.	8	18.7 I.
27	18.1 E.	16	2.8 E.	18	8.4 E.	24	18.9 E.	9	9.1 W.	Oct. 30	5.9 W.
Mar. 4	6.5 E.	20	15.2 E.	22	2.8 I.	28	13.8 I.	14	19.3 S.	Nov. 4	10.1 S.
8	18.8 E.	Nov. 16	21.0 E.	26	4.4 W.	June 1	15.8 W.	19	5.3 E.	8	19.9 E.
13	7.2 E.	21	9.6 E.	Mar. 2	7.6 S.	5	19.4 S.	24	6.4 I.	14	8.8 I.
17	19.6 E.	25	22.2 E.	6	5.7 E.	Dec. 2	20.6 E.	30	13.5 W.	20	16.6 W.
22	7.9 E.	30	10.8 E.	10	0.1 I.	6	16.0 I.	Apr. 5	0.0 S.	25	17.6 S.
26	20.3 E.	Dec. 4	23.4 E.	14	1.7 W.	10	18.1 W.	9	10.1 E.	30	5.0 E.
31	8.6 E.	9	12.0 E.	18	5.0 S.	14	21.7 S.	14	11.4 I.	Dec. 5	18.3 I.
Apr. 4	21.0 E.	14	0.6 E.	22	3.1 E.	18	20.0 E.	20	18.4 W.	12	0.3 W.
9	9.4 E.	18	13.2 E.	25	21.5 I.	22	15.1 I.	26	5.4 S.	17	1.3 S.
13	21.7 E.	23	1.8 E.	29	23.1 W.	26	17.0 W.	30	15.6 E.	21	13.1 E.
18	10.1 E.	27	14.4 E.	Apr. 3	2.4 S.	30	20.5 S.	May 5	17.3 I.	27	2.7 I.

IAPETUS.

d	h	d	h	d	h	d	h	d	h	d	h
Jan. 16	0.0 I.	Mar. 16	19.9 E.	May 13	20.6 S.	July 12	12.9 W.	Oct. 22	15.2 S.	Dec. 21	17.5 W.
Feb. 4	9.6 W.	Apr. 4	18.0 I.	June 3	18.6 E.	Aug. 2	6.0 S.	Nov. 12	15.4 E.		
24	9.2 S.	23	15.5 W.	23	3.0 I.	Oct. 1	21.0 W.	Dec. 2	9.5 I.		

THE APPARENT ELEMENTS OF SATURN'S RINGS.

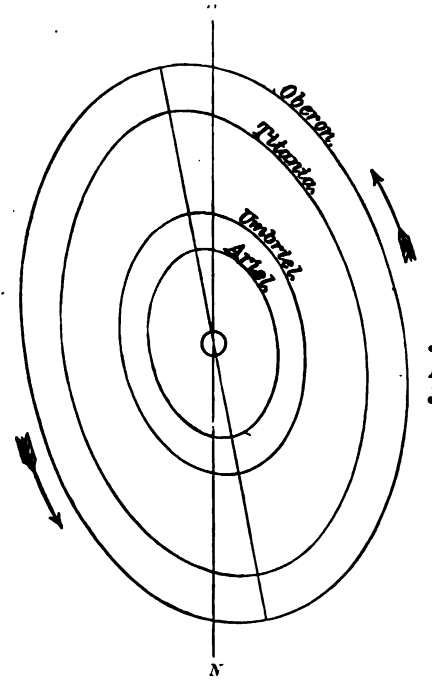
Greenwich Mean Noon.	a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-Minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on Equator.	u' Ecliptic.
Jan. 0	42″.07	1″.58	− 5° 10′.7	− 2° 9′.0	− 4° 42′.2	222° 39′.7	180° 8′.0
20	43.40	1.86	− 5 12.9	− 2 27.7	− 4 23.6	222 15.3	179 44.7
Feb. 9	44.39	2.36	− 5 18.0	− 3 3.2	− 4 4.9	221 17.9	178 47.4
Mar. 1	44.82	2.97	− 5 24.8	− 3 48.2	− 3 46.3	219 59.1	177 28.7
21	44.58	3.54	− 5 31.8	− 4 33.1	− 3 27.7	218 36.4	176 6.1
Apr. 10	43.76	3.93	− 5 38.0	− 5 9.0	− 3 9.1	217 20.5	174 50.3
30	42.51	4.05	− 5 41.5	− 5 28.2	− 2 50.5	216 37.3	174 7.1
May 20	41.07	3.90	− 5 41.2	− 5 26.4	− 2 31.8	216 40.9	174 10.8
June 9	39.63	3.53	− 5 38.6	− 5 6.8	− 2 13.2	217 11.4	174 41.4
29	38.34	3.00	− 5 33.3	− 4 29.7	− 1 54.6	218 15.2	175 45.3
July 19	37.29	2.37	− 5 25.6	− 3 38.5	− 1 35.9	219 46.3	177 16.4
Aug. 8	36.54	1.67	− 5 16.0	− 2 37.2	− 1 17.3	221 38.0	179 8.3
28	36.10	0.94	− 5 4.9	− 1 29.5	− 0 58.8	223 43.4	181 13.7
Sept. 17	36.00	0.20	− 4 52.9	− 0 19.6	− 0 40.2	225 55.3	183 25.7
Oct. 7	36.23	0.51	− 4 40.8	+ 0 48.4	− 0 21.7	228 6.2	185 36.7
27	36.80	1.18	− 4 29.2	+ 1 50.2	− 0 3.2	230 8.3	187 38.9
Nov. 16	37.70	1.77	− 4 18.9	+ 2 41.6	+ 0 15.3	231 53.7	189 24.3
Dec. 6	38.87	2.24	− 4 11.0	+ 3 18.4	+ 0 33.8	233 14.1	190 44.8
26	40.25	2.54	− 4 6.3	+ 3 37.4	+ 0 52.3	234 2.2	191 33.0
31	40.61	2.58	− 4 5.6	+ 3 39.1	+ 0 56.9	234 8.4	191 39.3

The factor to be multiplied by a and b to obtain the axes of—

The inner ellipse of the outer ring = 0.8801 log factor = 9.9445
The outer ellipse of the inner ring = 0.8599 log factor = 9.9344
The inner ellipse of the inner ring = 0.6650 log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486 log factor = 9.7392

NOTE.—The negative sign of l indicates that the visible surface of the ring is the southern one.

Date.	Position Angle.	App. Distances. Ariel.	Umbriel.
	°	″	″
Jan. 17,	9.7	14.3	19.9
Apr. 17,	10.3	15.1	21.1
July 17,	10.9	14.4	20.0



Date.	Position Angle.	App. Distances. Titania.	Oberon.
	°	″	″
Jan. 17,	9.7	32.6	43.7
Apr. 17,	10.3	34.5	46.2
July 17,	10.9	32.8	43.9

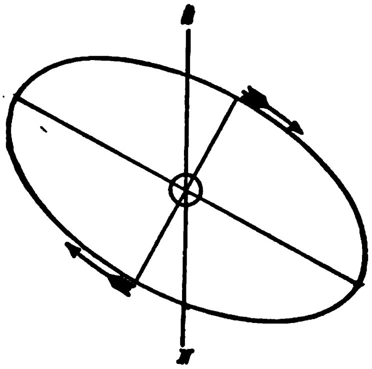
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1891, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.						UMBRIEL.						TITANIA.						OBERON.			
North.			South.			North.			South.			North.			South.			North and South.			
	d	h		d	h		d	h		d	h		d	h		d	h		d	h	
Jan.	19	8.4	Jan.	23	3.1	Jan.	17	15.2	Jan.	19	16.9	Jan.	12	16.8	Jan.	17	1.3	Jan.	18	3.3	N.
	26	21.9		30	16.6		25	22.1		27	23.8		21	9.8		25	18.2		24	20.9	S.
Feb.	3	11.3	Feb.	7	6.1	Feb.	3	5.0	Feb.	5	6.8		30	2.7	Feb.	3	11.2		31	14.5	N.
	11	0.8		14	19.5		11	11.9		13	13.7	Feb.	7	19.7		12	4.1	Feb.	7	8.0	S.
	18	14.2		22	9.0		19	18.9		21	20.6		16	12.6		20	21.1		14	1.6	N.
	26	3.7	Mar.	1	22.4		28	1.8	Mar.	2	3.5		25	5.6	Mar.	1	14.0		20	19.2	S.
Mar.	5	17.2		9	11.9	Mar.	8	8.7		10	10.4	Mar.	5	22.5		10	7.0		27	12.8	N.
	13	6.6		17	1.3		16	15.7		18	17.4		14	15.5		18	23.9	Mar.	6	6.3	S.
	20	20.1		24	14.8		24	22.6		27	0.2		23	8.4		27	16.9		12	23.9	N.
	28	9.5	Apr.	1	4.3	Apr.	2	5.5	Apr.	4	7.2	Apr.	1	1.4	Apr.	5	9.8		19	17.5	S.
Apr.	4	23.0		8	17.7		10	12.4		12	14.1		9	18.4		14	2.8		26	11.1	N.
	12	12.4		16	7.2		18	19.4		20	21.1		18	11.4		22	19.9	Apr.	2	4.7	S.
	20	1.9		23	20.6		27	2.3		29	4.0		27	4.4	May	1	12.8		8	22.3	N.
	27	15.4	May	1	10.1	May	5	9.2	May	7	10.9	May	5	21.3		10	5.8		15	15.8	S.
May	5	4.8		8	23.5		13	16.2		15	17.9		14	14.3		18	22.7		22	9.5	N.
	12	18.3		16	13.0		21	23.1		24	0.8		23	7.2		27	15.7		29	3.0	S.
	20	7.7		24	2.5		30	6.1	June	1	7.7	June	1	0.1	June	5	8.6	May	5	20.7	N.
	27	21.2		31	15.9	June	7	13.0		9	14.7		9	17.1		14	1.5		12	14.2	S.
June	4	10.7	June	8	5.4		15	19.9		17	21.6		18	10.0		22	18.5		19	7.9	N.
	12	0.1		15	18.8		24	2.9		26	4.5		27	3.0	July	1	11.4		26	1.4	S.
	19	13.6		23	8.3	July	2	9.8	July	4	11.4	July	5	19.9		10	4.4	June	1	19.1	N.
	27	3.0		30	21.7		10	16.7		12	18.4		14	12.8		18	21.3		8	12.5	S.
July	4	16.5	July	8	11.2		18	23.6		21	1.3		23	5.8		27	14.2		15	6.3	N.
	12	6.0		16	0.7		27	6.6		29	8.2		31	22.7	Aug.	5	7.2		21	23.7	S.
	19	19.4		23	14.1	Aug.	4	13.5	Aug.	6	15.1	Aug.	9	15.7		14	0.1		28	17.5	N.

	d	h		d	h
Period of Ariel,	2	12.489	Period of Titania,	8	16.942
Period of Umbriel,	4	3.460	Period of Oberon,	13	11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle.	Apparent Distance.
Jan. 10,	239°.6	16″.8
Nov. 24,	242.9	17.0

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1891, *AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

North East.			South West.			North East.			South West.			North East.			South West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	23.7	Jan.	4	22.3	Aug.	30	21.1	Sept.	2	19.7	Nov.	3	12.6	Nov.	6	11.1
	7	20.8		10	19.3	Sept.	5	18.2		8	16.7		9	9.7		12	8.2
	13	17.8		16	16.3		11	15.2		14	13.7		15	6,7		18	5.2
	19	14.8		22	13.4		17	12.3		20	10.8		21	3.8		24	2.3
	25	11.9		28	10.4		23	9.3		26	7.8		27	0.8		29	23.3
	31	8.9	Feb.	3	7.5		29	6.4	Oct.	2	4.9	Dec.	2	21.9	Dec.	5	20.4
Feb.	6	6.0		9	4.5	Oct.	5	3.4		8	1.9		8	18.9		11	17.4
	12	3.0		15	1.6		11	0.5		13	23.0		14	15.9		17	14.5
	18	0.1		20	22.6		16	21.5		19	20.0		20	13.0		23	11.5
	23	21.1		26	19.6		22	18.5		25	17.1		26	10.0		29	8.6
Mar.	1	18.2	Mar.	4	16.7		28	15.6		31	14.1	Jan.	1	7.1	Jan.	4	5.6

The above times are those of each passage of the satellite through an apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\,21^h.045$.

In the above diagrams, the central circle represents the planet, and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
Jan.	2	8	7	☿ in ☊		
	3	15	46	☿ Stationary.		
	4	2	5	☌ ⛢ ☽ .... ⛢ −	3	20
	6	22	–	☿ in Perihelion.		
	7	1	8	☌ ♀ ☽ .... ♀ +	4	19
	8	–	–	♀ Greatest brilliancy.		
	8	5	–	♀ in Perihelion.		
	10	7	3	☌ ☿ ☽ .... ☿ +	5	56
	11	15	20	☌ ♃ ☽ .... ♃ +	3	58
	13	0	23	☌ ☿ ☉ Inferior.		
	13	21	28	☌ ♂ ☽ .... ♂ +	4	57
	17	5	34	☿ Greatest Hel. Lat. N.		
	19	9	23	☌ ♆ ☽ .... ♆ −	0	48
	20	22	–	□ ⛢ ☉		
	24	7	–	☿ Stationary.		
	27	16	23	☌ ♄ ☽ .... ♄ −	3	15
	30	6	–	♀ Greatest Hel. Lat. N.		
	31	11	–	☌ ⛢ ☽ .... ⛢ −	3	4
Feb.	4	2	–	⛢ Stationary.		
	5	0	26	☌ ♀ ☽ .... ♀ +	5	27
	5	16	40	☿ Greatest elong. W.	25	40
	6	12	30	☌ ☿ ☽ .... ☿ +	3	46
	8	12	24	☌ ♃ ☽ .... ♃ +	4	12
	9	16	47	☿ in ☋		
	11	17	38	☌ ♂ ☽ .... ♂ +	4	38
	12	21	–	♆ Stationary.		
	12	21	57	☌ ♃ ☉		
	13	3	32	♀ Greatest elong. W.	46	51
	15	14	56	☌ ♆ ☽ .... ♆ −	0	59
	19	21	47	☿ in Aphelion.		
	21	5	–	♂ in ☊		
	22	5	–	□ ♆ ☉		
	23	19	–	☌ ♄ ☽ .... ♄ −	3	4
	27	16	54	☌ ⛢ ☽ .... ⛢ −	2	49
Mar.	3	22	12	☍ ♄ ☉		
	4	14	24	☌ ☿ ♃ .... ☿ −	1	26
	6	11	18	☌ ♀ ☽ .... ♀ +	5	35
	8	9	53	☌ ♃ ☽ .... ♃ +	4	24
	8	19	32	☌ ☿ ☽ .... ☿ +	3	1
	12	7	15	☿ Greatest Hel. Lat. S.		
	12	15	13	☌ ♂ ☽ .... ♂ +	3	25
	14	23	5	☌ ♆ ☽ .... ♆ −	1	16
	20	4	9	☉ enters ♈, Spring com.		
	22	20	54	☌ ♄ ☽ .... ♄ −	3	5
	23	7	50	☌ ☿ ☉ Superior.		
	26	21	6	☌ ⛢ ☽ .... ⛢ −	2	41
	27	7	36	♀ in ☋		
	31	7	22	☿ in ☊		
Apr.	4	21	27	☿ in Perihelion.		
	5	2	24	☌ ♀ ☽ .... ♀ +	4	51
	5	5	31	☌ ♃ ☽ .... ♃ +	4	34
Apr.	7	4	17	☌ ♀ ♃ .... ♀ +	0	13
	9	6	6	☌ ☿ ☽ .... ☿ +	4	37
	10	13	20	☌ ♂ ☽ .... ♂ +	1	44
	11	9	45	☌ ♆ ☽ .... ♆ −	1	30
	15	4	48	☿ Greatest Hel. Lat. N.		
	18	15	–	☿ Greatest elong. E.	20	1
	19	0	25	☌ ♄ ☽ .... ♄ −	3	16
	19	1	–	☍ ⛢ ☉		
	23	1	18	☌ ⛢ ☽ .... ⛢ −	2	46
	27	23	18	☌ ♂ ♆ .... ♂ +	2	17
	28	21	16	☿ Stationary.		
	30	12	15	♀ in Aphelion.		
May	2	21	49	☌ ♃ ☽ .... ♃ +	4	36
	4	20	33	☌ ♀ ☾ .... ♀ +	2	54
	7	17	5	☌ ☿ ☽ .... ☿ +	1	46
	8	16	4	☿ in ☋		
	8	21	28	☌ ♆ ☽ .... ♆ −	1	40
	9	9	33	☌ ☿ ☉ Inferior.		
	9	10	37	☌ ♂ ☽ .... ♂ +	0	1
	9	–	–	☿ Transit over sun's disk.		
	12	16	5	♄ Stationary.		
	16	6	57	☌ ♄ ☽ .... ♄ −	3	27
	18	21	7	☿ in Aphelion.		
	20	6	47	☌ ⛢ ☽ .... ⛢ −	2	54
	21	16	–	☿ Stationary.		
	23	–	–	☽ eclipsed, invis. at Wash.		
	23	4	24	♀ Greatest Hel. Lat. S.		
	27	11	–	☌ ♆ ☉		
	30	10	16	☌ ♃ ☽ .... ♃ +	4	33
	31	18	3	□ ♄ ☉		
June	3	18	6	☌ ♀ ☽ .... ♀ +	0	12
	4	3	31	☌ ☿ ☽ .... ☿ −	2	23
	4	21	–	☿ Greatest elong. W.	24	2
	5	8	12	☌ ♆ ☽ .... ♆ −	1	44
	6	–	–	☉ eclipsed, invis. at Wash.		
	7	0	–	□ ♃ ☉		
	7	6	28	☌ ♂ ☽ .... ♂ −	1	29
	8	6	30	☿ Greatest Hel. Lat. S.		
	12	16	36	☌ ♄ ☽ .... ♄ −	3	30
	16	13	49	☌ ⛢ ☽ .... ⛢ −	2	57
	17	15	–	☌ ☿ ♆ .... ☿ −	0	19
	21	0	16	☉ enters ♋, Summer com.		
	22	3	–	☌ ♀ ♆ .... ♀ +	0	29
	26	19	16	☌ ♃ ☽ .... ♃ +	4	15
	27	6	28	☿ in ☊		
July	1	20	41	☿ in Perihelion.		
	2	17	5	☌ ♆ ☽ .... ♆ −	1	52
	3	10	–	⊕ in Aphelion.		
	3	17	54	☌ ♀ ☽ .... ♀ −	2	7
	5	7	25	☌ ☿ ☽ ..... ☿ −	1	52
	5	8	–	⛢ Stationary.		

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		° ′
July	6	0	55	☌ ♂ ☽ .... ♂ −	2 43
	6	13	10	☌ ☿ ☉ Superior.	
	7	17	-	♃ Stationary.	
	10	4	23	☌ ♄ ☽ .... ♄ −	3 25
	11	7	-	☌ ☿ ♂ .... ☿ +	0 41
	12	4	2	☿ Greatest Hel. Lat. N.	
	13	22	1	☌ ⛢ ☽ .... ⛢ −	2 50
	18	11	-	♀ in ☊	
	19	17	-	□ ⛢ ☉	
	24	2	-	☌ ♃ ☽ .... ♃ +	3 56
	29	14	33	☌ ♂ ☉	
	30	0	12	☌ ♆ ☽ .... ♆ −	2 4
Aug.	2	20	4	☌ ♀ ☽ .... ♀ −	3 34
	3	18	29	☌ ♂ ☽ .... ♂ −	3 35
	4	15	25	☿ in ☋	
	6	2	6	☌ ☿ ☽ .... ☿ −	5 38
	6	17	13	☌ ♄ ☽ .... ♄ −	3 16
	10	6	47	☌ ⛢ ☽ .... ⛢ −	2 33
	13	8	0	☌ ☿ ♄ .... ☿ −	3 36
	14	21	23	☿ in Aphelion.	
	16	7	-	☿ Greatest elong. E.	27 25
	20	7	17	☌ ♃ ☽ .... ♃ +	3 44
	20	21	-	♀ in Perihelion.	
	21	14	56	☌ ♀ ♂ .... ♀ +	0 1
	25	10	-	♂ Greatest Hel. Lat. N.	
	26	6	35	☌ ♆ ☽ .... ♆ −	2 22
	29	15	-	☿ Stationary.	
Sept.	1	3	-	□ ♆ ☉	
	1	12	1	☌ ♂ ☽ .... ♂ −	4 5
	2	2	35	☌ ♀ ☽ .... ♀ −	3 48
	3	6	18	☌ ♄ ☽ .... ♄ −	3 6
	3	17	39	☌ ☿ ☽ .... ☿ −	9 42
	4	5	31	☿ Greatest Hel. Lat. S.	
	5	5	4	☍ ♃ ☉	
	6	15	38	☌ ⛢ ☽ .... ⛢ −	2 14
	11	15	-	♆ Stationary.	
	11	21	16	♀ Greatest Hel. Lat. N.	
	12	12	3	☌ ☿ ☉ Inferior.	
	12	20	30	☌ ♄ ☉	
	14	6	24	☌ ♀ ♄ .... ♀ −	0 32
	16	12	39	☌ ♃ ☽ .... ♃ +	3 45
	17	21	58	☌ ♀ ☉ Superior.	
	20	22	-	☿ Stationary.	
	22	-	-	♄ Disappearance of ring.	
	22	14	-	☌ ♆ ☽ .... ♆ −	2 40
	22	14	57	☉ enters ♎, Autumn com.	
	23	6	25	☿ in ☊	
	27	20	-	☿ in Perihelion.	
	28	4	-	☿ Greatest elong. W.	17 53
	29	11	29	♂ in Aphelion.	
	30	6	25	☌ ♂ ☽ .... ♂ −	4 1
Sept.	30	14	4	☌ ☿ ☽ .... ☿ −	3 31
	30	19	18	☌ ♄ ☽ .... ♄ −	2 59
Oct.	2	13	52	☌ ☿ ♄ .... ☿ −	0 12
	2	14	10	☌ ♀ ☽ .... ♀ −	2 36
	4	0	43	☌ ⛢ ☽ .... ⛢ −	1 59
	8	3	17	☿ Greatest Hel. Lat. N.	
	12	10	17	☌ ♂ ♄ .... ♂ −	0 52
	13	18	38	☌ ♃ ☽ .... ♃ +	3 57
	16	13	32	☌ ♀ ⛢ .... ♀ +	0 21
	19	22	37	☌ ♆ ☽ .... ♆ −	2 49
	24	18	-	☌ ⛢ ☉	
	25	19	23	☌ ☿ ⛢ .... ☿ +	0 10
	27	9	27	☌ ☿ ☉ Superior.	
	28	8	11	☌ ♄ ☽ .... ♄ −	2 52
	29	2	20	☌ ♂ ☽ .... ♂ −	3 20
	30	-	-	♄ Reappearance of ring.	
	31	10	28	☌ ⛢ ☽ .... ⛢ −	1 49
	31	14	40	☿ in ☋	
Nov.	1	7	1	☌ ☿ ☽ .... ☿ −	1 27
	2	2	24	☌ ♀ ☽ .... ♀ −	0 13
	3	5	40	♃ Stationary.	
	7	0	23	♀ in ☋	
	10	1	42	☌ ♃ ☽ .... ♃ +	4 9
	10	19	39	☿ in Aphelion.	
	15	-	-	☽ eclipsed, visible at Wash.	
	16	8	13	☌ ♆ ☽ .... ♆ −	2 48
	24	20	42	☌ ♄ ☽ .... ♄ −	2 40
	26	23	44	☌ ♂ ☽ .... ♂ −	2 3
	27	21	8	☌ ⛢ ☽ .... ⛢ −	1 40
	29	10	-	☍ ♆ ☉	
	30	-	-	☉ eclipsed, invis. at Wash.	
Dec.	1	4	55	□ ♃ ☉	
	1	5	1	☿ Greatest Hel. Lat. S.	
	2	8	31	☌ ☿ ☽ .... ☿ +	0 30
	2	9	5	☌ ♀ ☽ .... ♀ +	1 54
	4	21	55	☌ ☿ ♀ .... ☿ −	1 15
	6	11	-	☌ ☿ λ Sagittarii . ☿ −	0 10
	7	10	42	☌ ♃ ☽ .... ♃ +	4 12
	10	22	4	☿ Greatest elong. E.	20 36
	11	3	46	♀ in Aphelion.	
	13	16	57	☌ ♆ ☽ .... ♆ −	2 45
	14	16	50	☌ ♂ ⛢ .... ♂ +	0 29
	18	18	-	☿ Stationary.	
	20	5	20	☿ in ☊	
	21	6	-	□ ♄ ☉	
	21	10	43	☉ enters ♑, Winter com.	
	22	8	2	☌ ♄ ☽ .... ♄ −	2 21
	24	19	14	☿ in Perihelion.	
	25	8	14	☌ ⛢ ☽ .... ⛢ −	1 28
	25	21	48	☌ ♂ ☽ .... ♂ −	0 25
	28	4	45	☌ ☿ ☉ inferior.	
	30	1	21	☌ ☿ ☽ .... ☿ +	6 6

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Åbo	+ 60 26 56.8	− 9 53.5	9.998902	− 6 37 18.45	− 1 29 6.41
Adelaide	− 34 55 33.8	+ 10 47.6	9.999527	− 14 22 32.34	− 9 14 20.30
Albany	+ 42 39 49.5	− 11 28.2	9.999336	− 0 13 12.87	+ 4 54 59.17
Alfred (N. Y.)	+ 42 15 19.8	− 11 27.2	9.999346	+ 0 2 55.00	+ 5 11 7.04
Algier	+ 36 45 2.7	− 11 1.6	9.999483	− 5 20 23.43	− 0 12 11.39
Allegheny	+ 40 27 41.6	− 11 21.6	9.999391	+ 0 11 50.89	+ 5 20 2.93
Altona	+ 53 32 45.3	− 11 0.8	9.999063	− 5 47 58.39	− 0 39 46.35
Amherst	+ 42 22 17.1	− 11 27.5	9.999343	− 0 18 7.37	+ 4 50 4.67
Annapolis	+ 38 58 53.5	− 11 15.0	9.999428	− 0 2 15.60	+ 5 5 56.44
Ann Arbor	+ 42 16 48.0	− 11 27.3	9.999346	+ 0 26 43.10	+ 5 34 55.14
Arcetri	+ 43 45 14.4	− 11 29.9	9.999308	− 5 53 15.15	− 0 45 3.11
Armagh	+ 54 21 12.7	− 10 54.9	9.999043	− 4 41 36.54	+ 0 26 35.5
Athens	+ 37 58 20.0	− 11 9.4	9.999453	− 6 43 7.74	− 1 34 55.7
Beloit	+ 42 30 9.0	− 11 27.8	9.999340	+ 0 47 55.26	+ 5 56 7.30
Berlin	+ 52 30 16.7	− 11 7.7	9.999088	− 6 1 46.95	− 0 53 34.91
Berne	+ 46 57 8.7	− 11 29.2	9.999227	− 5 37 58.04	− 0 29 46.0
Bethlehem	+ 40 36 23.9	− 11 22.2	9.999388	− 0 6 40.19	+ 5 1 31.85
Birr Castle	+ 53 5 47.0	− 11 3.9	9.999074	− 4 36 31.14	+ 0 31 40.9
Bologna	+ 44 29 47.0	− 11 30.5	9.999289	− 5 53 36.64	− 0 45 24.6
Bonn	+ 50 43 45.0	− 11 17.3	9.999132	− 5 36 35.33	− 0 28 23.29
Bordeaux	+ 44 50 16.7	− 11 30.7	9.999281	− 5 6 6.60	+ 0 2 5.44
Bothkamp	+ 54 12 9.6	− 10 56.0	9.999047	− 5 48 42.84	− 0 40 30.8
Breslau	+ 51 6 56.5	− 11 15.4	9.999122	− 6 16 20.75	− 1 8 8.71
Brussels	+ 50 51 10.5	− 11 16.8	9.999129	− 5 25 40.64	− 0 17 28.6
Cambridge (*England*)	+ 52 12 51.6	− 11 9.4	9.999095	− 5 8 34.79	− 0 0 22.75
Cambridge (*Mass.*)	+ 42 22 47.6	− 11 27.6	9.999343	− 0 23 41.05	+ 4 44 30.99
Cape of Good Hope	− 33 56 3.4	+ 10 39.0	9.999550	− 6 22 6.78	− 1 13 54.74
Chapultepec	+ 19 25 17.5	− 7 12.0	9.999841	+ 1 28 26.20	+ 6 36 38.24
Charkow	+ 50 0 10.2	− 11 20.5	9.999150	− 7 33 6.74	− 2 24 54.7
Chicago	+ 41 50 1.0	− 11 26.2	9.999357	+ 0 42 14.69	+ 5 50 26.73
Christiania	+ 59 54 43.7	− 10 0.2	9.998914	− 5 51 5.89	− 0 42 53.85
Cincinnati (*New Obs.*)	+ 39 8 19.5	− 11 15.8	9.999424	+ 0 29 29.25	+ 5 37 41.29
Cincinnati (*Old Obs.*)	+ 39 6 26.5	− 11 15.6	9.999425	+ 0 29 47.01	+ 5 37 59.05
Clinton	+ 43 3 17.0	− 11 28.9	9.999326	− 0 6 34.65	+ 5 1 37.39
Coimbra	+ 40 12 25.8	− 11 20.6	9.999398	− 4 34 37.54	+ 0 33 34.5
Copenhagen	+ 55 41 13.6	− 10 43.9	9.999011	− 5 58 30.96	− 0 50 18.92
Cordoba	− 31 25 15.5	+ 10 13.5	9.999608	− 0 51 23.84	+ 4 16 48.2
Cracow	+ 50 3 50.0	− 11 20.3	9.999149	− 6 28 2.41	− 1 19 50.37
Dantzig	+ 54 21 18.0	− 10 54.9	9.999043	− 6 22 51.34	− 1 14 39.3
Dorpat	+ 58 22 47.4	− 10 17.6	9.998948	− 6 55 5.54	− 1 46 53.5
Dresden	+ 51 2 16.8	− 11 15.8	9.999124	− 6 3 6.88	− 0 54 54.84
Dublin	+ 53 23 13	− 11 1.9	9.999066	− 4 42 50.04	+ 0 25 22
Düsseldorf	+ 51 12 25	− 11 15.0	9.999120	− 5 35 17.04	− 0 27 5
Dun Echt	+ 57 9 36	− 10 30.2	9.998977	− 4 58 32.04	+ 0 9 40.0
Durham	+ 54 46 6.2	− 10 51.6	9.999033	− 5 1 52.24	+ 0 6 19.8
Edinburgh	+ 55 57 23.2	− 10 41.5	9.999005	− 4 55 28.99	+ 0 12 43.05
Florence	+ 43 46 4.1	− 11 29.9	9.999308	− 5 53 13.54	− 0 45 1.5

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude From Washington.	Longitude From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Geneva . . .	+ 46 11 58.8	− 11 30.1	9.999246	− 5 32 48.81	− 0 24 36.77
Georgetown . .	+ 38 54 26.2	− 11 14.6	9.999430	+ 0 0 6.20	+ 5 8 18.24
Glasgow (*Missouri*) .	+ 39 13 45.6	− 11 16.2	9.999422	+ 1 3 5.93	+ 6 11 17.97
Glasgow (*Scotland*) .	+ 55 52 42.8	− 10 42.2	9.999006	− 4 51 1.44	+ 0 17 10.6
Göttingen . .	+ 51 31 47.9	− 11 13.3	9.999112	− 5 47 58.28	− 0 39 46.24
Gotha . . .	+ 50 56 37.5	− 11 16.3	9.999127	− 5 51 2.57	− 0 42 50.53
Greenwich . .	+ 51 28 38.4	− 11 13.6	9.999113	− 5 8 12.04	0 0 0
Hamburg . .	+ 53 33 7.0	− 11 0.8	9.999062	− 5 48 5.74	− 0 39 53.7
Hanover . . .	+ 43 42 15	− 11 29.8	9.999309	− 0 19 4.13	+ 4 49 7.91
Hastings-on-Hudson .	+ 40 59 25	− 11 23.6	9.999378	− 0 12 42.4	+ 4 55 29.64
Haverford . .	+ 40 0 40.1	− 11 19.8	9.999402	− 0 6 59.34	+ 5 1 12.70
Helsingfors . .	+ 60 9 43.3	− 9 57.1	9.998909	− 6 48 1.20	− 1 39 49.16
Hudson . . .	+ 41 14 42.6	− 11 24.4	9.999371	+ 0 17 32.12	+ 5 25 44.16
Ipswich . . .	+ 52 0 33.0	− 11 11.0	9.999100	− 5 13 7.84	− 0 4 55.80
Karlsruhe . .	+ 49 0 29.6	− 11 24.2	9.999175	− 5 41 48.55	− 0 33 36.51
Kasan . . .	+ 55 47 24.2	− 10 43.0	9.999009	− 8 24 40.94	− 3 16 28.9
Kew . . .	+ 51 28 6	− 11 13.6	9.999114	− 5 6 56.94	+ 0 1 15.1
Kiel . . .	+ 54 20 29.7	− 10 55.0	9.999043	− 5 48 47.80	− 0 40 35.76
Kiew . . .	+ 50 27 11.1	− 11 18.6	9.999139	− 7 10 12.68	− 2 2 0.64
Königsberg . .	+ 54 42 50.6	− 10 52.0	9.999034	− 6 30 10.95	− 1 21 58.91
Kremsmünster . .	+ 48 3 23.7	− 11 27.0	9.999199	− 6 4 44.24	− 0 56 32.2
Leiden . . .	+ 52 9 20.0	− 11 9.8	9.999097	− 5 26 8.39	− 0 17 56.35
Leipzig . . .	+ 51 20 6.3	− 11 14.3	9.999117	− 5 57 46.06	− 0 49 34.02
Leyton . . .	+ 51 34 34	− 11 13.0	9.999111	− 5 8 11.17	+ 0 0 0.87
Lisbon (*Marine Obs.*)	+ 38 42 17.6	− 11 13.5	9.999435	− 4 31 47.04	+ 0 36 25.0
Lisbon (*Royal Obs.*) .	+ 38 42 31.3	− 11 13.6	9.999435	− 4 31 27.36	+ 0 36 44.68
Liverpool . .	+ 53 24 4	− 11 1.8	9.999066	− 4 55 54.84	+ 0 12 17.2
Lübec . . .	+ 53 51 31.2	− 10 58.6	9.999055	− 5 50 57.59	− 0 42 45.55
Lund . . .	+ 55 41 52.1	− 10 43.8	9.999011	− 6 0 57.07	− 0 52 45.03
Lyons . . .	+ 45 41 40.0	− 11 30.5	9.999259	− 5 27 19.90	− 0 19 7.86
Madison . . .	+ 43 4 37.0	− 11 28.9	9.999325	+ 0 49 25.79	+ 5 57 37.83
Madras . . .	+ 13 4 8.1	− 5 3.3	9.999926	−10 29 11.46	− 5 20 59.42
Madrid . . .	+ 40 24 30.0	− 11 21.4	9.999393	− 4 53 26.64	+ 0 14 45.4
Manheim . . .	+ 49 29 11.0	− 11 22.5	9.999163	− 5 42 2.56	− 0 33 50.52
Marburg . . .	+ 50 48 46.9	− 11 16.9	9.999130	− 5 43 17.04	− 0 35 5.0
Markree . . .	+ 54 10 31.8	− 10 56.2	9.999047	− 4 34 23.64	+ 0 33 48.4
Marseilles . .	+ 43 18 19.1	− 11 29.3	9.999320	− 5 29 46.68	− 0 21 34.64
Melbourne . .	− 37 49 53.3	+ 11 8.6	9.999456	−14 48 6.18	− 9 39 54.14
Mexico . . .	+ 19 26 1.3	− 7 12.2	9.999840	+ 1 28 14.63	+ 6 36 26.67
Milan . . .	+ 45 27 59.2	− 11 30.6	9.999265	− 5 44 58.01	− 0 36 45.97
Modena . . .	+ 44 38 52.8	− 11 30.6	9.999285	− 5 51 54.84	− 0 43 42.8
Montsouris . .	+ 48 49 18.0	− 11 24.8	9.999180	− 5 17 32.72	− 0 9 20.68
Moscow . . .	+ 55 45 19.8	− 10 43.3	9.999009	− 7 38 28.94	− 2 30 16.9
Mount Hamilton .	+ 37 20 23.5	− 11 5.5	9.999468	+ 2 58 22.05	+ 8 6 34.09
Munich . . .	+ 48 8 45.5	− 11 26.7	9.999197	− 5 54 38.17	− 0 46 26.13
Naples . . .	+ 40 51 45.4	− 11 23.1	9.999381	− 6 5 12.94	− 0 57 0.9
Nashville . .	+ 36 8 58.2	− 10 57.3	9.999497	+ 0 38 55.93	+ 5 47 7.97

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Natal . . .	− 29 50 47.0	+ 9 55.2	9.999642	− 7 10 13.20	− 2 2 1.16
Neuchatel . .	+ 46 59 51.0	− 11 29.1	9.999226	− 5 36 2.24	− 0 27 50.2
New Haven . .	+ 41 18 36.5	− 11 24.6	9.999370	− 0 16 29.90	+ 4 51 42.14
New York (*Columb. Coll.*)	+ 40 45 23.1	− 11 22.7	9.999384	− 0 12 18.40	+ 4 55 53.64
New York (RUTHERFURD)	+ 40 43 48.5	− 11 22.6	9.999384	− 0 12 15.00	+ 4 55 57.04
Nice . . .	+ 43 43 16.7	− 11 29.8	9.999309	− 5 37 24.24	− 0 29 12.20
Nicolaeff . . .	+ 46 58 20.6	− 11 29.2	9.999226	− 7 16 6.14	− 2 7 54.1
Odessa . . .	+ 46 28 36	− 11 29.8	9.999239	− 7 11 14.34	− 2 3 2.3
Ogden . . .	+ 41 13 8.6	− 11 24.3	9.999372	+ 2 19 47.52	+ 7 27 59.56
Ó-Gyalla . . .	+ 47 52 43.4	− 11 27.4	9.999204	− 6 20 57.63	− 1 12 45.59
Olmütz . . .	+ 49 35 43	− 11 22.1	9.999160	− 6 17 14.64	− 1 9 2.6
Oxford (*Mississippi*)	+ 34 22 12.6	− 10 42.9	9.999540	+ 0 49 55.05	+ 5 58 7.09
Oxford (*Radcliffe*) .	+ 51 45 36.0	− 11 12.0	9.999106	− 5 3 9.44	+ 0 5 2.6
Oxford (*University*) .	+ 51 45 34.2	− 11 12.0	9.999106	− 5 3 11.64	+ 0 5 0.40
Padua . . .	+ 45 24 2.5	− 11 30.6	9.999266	− 5 55 41.17	− 0 47 29.13
Palermo . . .	+ 38 6 44	− 11 10.2	9.999449	− 6 1 37.04	− 0 53 25.0
Paramatta . .	− 33 48 49.8	+ 10 37.8	9.999553	−15 12 18.24	−10 4 6.2
Paris . . .	+ 48 50 11.8	− 11 24.8	9.999179	− 5 17 32.99	− 0 9 20.95
Philadelphia . .	+ 39 57 7.5	− 11 19.5	9.999404	− 0 7 33.58	+ 5 0 38.46
Plonsk . . .	+ 52 37 40.0	− 11 6.9	9.999085	− 6 29 44.05	− 1 21 32.01
Pola . . .	+ 44 51 49.0	− 11 30.6	9.999280	− 6 3 35.22	− 0 55 23.18
Portsmouth . .	+ 50 48 3.0	− 11 17.0	9.999130	− 5 3 48.14	+ 0 4 23.90
Potsdam . . .	+ 52 22 56	− 11 8.4	9.999091	− 6 0 29.04	− 0 52 17
Poughkeepsie . .	+ 41 41 18	− 11 25.8	9.999360	− 0 12 38.44	+ 4 55 33.6
Prague . . .	+ 50 5 18.8	− 11 20.2	9.999148	− 6 5 53.44	− 0 57 41.4
Princeton . .	+ 40 20 57.8	− 11 21.2	9.999394	− 0 9 34.54	+ 4 58 37.50
Pulkowa . . .	+ 59 46 18.7	− 10 1.8	9.998917	− 7 9 30.71	− 2 1 18.67
Quebec . . .	+ 46 48 17.3	− 11 29.4	9.999231	− 0 23 22.74	+ 4 44 49.3
Rio de Janeiro . .	− 22 54 23.8	+ 8 14.0	9.999782	− 2 15 30.63	+ 2 52 41.41
Rochester . .	+ 43 9 16.8	− 11 29.0	9.999324	+ 0 2 9.74	+ 5 10 21.78
Rome (*Coll. Rom.*) .	+ 41 53 53.6	− 11 26.3	9.999355	− 5 58 6.74	− 0 49 54.70
San Fernando . .	+ 36 27 41.5	− 10 59.5	9.999490	− 4 43 22.44	+ 0 24 49.6
Santiago de Chile .	− 33 26 42.0	+ 10 34.4	9.999561	− 0 25 25.74	+ 4 42 46.30
Schwerin . . .	+ 53 37 38.2	− 11 0.2	9.999061	− 5 53 52.74	− 0 45 40.7
Senftenberg . .	+ 50 5 10.1	− 11 20.2	9.999148	− 6 14 2.64	− 1 5 50.6
South Hadley . .	+ 42 15 18.2	− 11 27.3	9.999346	− 0 17 51.75	+ 4 50 20.29
Speier . . .	+ 49 18 55.4	− 11 23.2	9.999167	− 5 41 57.64	− 0 33 45.6
St. Louis . . .	+ 38 38 3.6	− 11 13.2	9.999437	+ 0 52 37.07	+ 6 0 49.11
St. Petersburg . .	+ 59 56 29.7	− 9 59.8	9.998913	− 7 9 25.54	− 2 1 13.5
Stockholm . .	+ 59 20 33.0	− 10 6.9	9.998927	− 6 20 26.04	− 1 12 14.00
Stonyhurst . .	+ 53 50 40	− 10 58.7	9.999055	− 4 58 19.36	+ 0 9 52.68
Strassburg (*New Obs.*)	+ 48 34 59.7	− 11 25.5	9.999186	− 5 39 16.69	− 0 31 4.65
Strassburg (*Old Obs.*)	+ 48 34 53.8	− 11 25.5	9.999186	− 5 39 14.53	− 0 31 2.49
Sydney . . .	− 33 51 41.1	+ 10 38.3	9.999552	−15 13 1.58	−10 4 49.54
Taschkent . .	+ 41 19 32.2	− 11 24.7	9.999369	− 9 45 22.84	− 4 37 10.80
Toulouse . . .	+ 43 36 47	− 11 29.7	9.999312	− 5 14 3.14	− 0 5 51.1
Turin . . .	+ 45 4 6.0	− 11 30.7	9.999275	− 5 39 0.44	− 0 30 48.4

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Twickenham . .	+ 51 27 4.2	− 11 13.7	9.999114	− 5 6 58.94	+ 0 1 13.1
Univ. of Virginia .	+ 38 2 1.2	− 11 9.8	9.999448	+ 0 5 53.18	+ 5 14 5.22
Upsala . . .	+ 59 51 31.5	− 10 0.8	9.998915	− 6 18 42.23	− 1 10 30.19
Utrecht . . .	+ 52 5 10.5	− 11 10.2	9.999098	− 5 28 43.74	− 0 20 31.7
Venice . . .	+ 45 25 49.5	− 11 30.6	9.999266	− 5 57 37.44	− 0 49 25.4
Vienna (*Josephstadt*)	+ 48 12 53.8	− 11 26.6	9.999195	− 6 13 37.34	− 1 5 25.3
Vienna (*New Obs.*) .	+ 48 13 55.4	− 11 26.5	9.999195	− 6 13 33.26	− 1 5 21.22
Vienna (*Old Obs.*) .	+ 48 12 35.5	− 11 26.6	9.999195	− 6 13 43.78	− 1 5 31.74
Warsaw . . .	+ 52 13 5.7	− 11 9.4	9.999095	− 6 32 19.44	− 1 24 7.4
Washington . .	+ 38 53 38.8	− 11 14.5	9.999430	0 0 0	+ 5 8 12.04
West Point . .	+ 41 23 31	− 11 24.9	9.999368	− 0 12 22.71	+ 4 55 49.33
Wilhelmshaven .	+ 53 31 52.0	− 11 0.9	9.999063	− 5 40 47.25	− 0 32 35.21
Williamstown (*Mass.*)	+ 42 42 49	− 11 28.3	9.999334	− 0 15 18.6	+ 4 52 53.44
Williamstown (*Victoria*)	− 37 52 7.2	+ 11 8.8	9.999455	− 14 47 50.84	− 9 39 38.8
Wilna . . .	+ 54 41 0	− 10 52.3	9.999035	− 6 49 23.94	− 1 41 11.9
Windsor . . .	− 33 36 28.9	+ 10 35.9	9.999558	− 15 11 32.81	− 10 3 20.77
Zürich . . .	+ 47 22 40.0	− 11 28.5	9.999216	− 5 42 24.64	− 0 34 12.6

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

THE greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of several different kinds of time: mean solar time; true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun,* is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over the meridian, and its next succeeding return to the same meridian. It is about $3^m 56^s$ shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about $3^m 46^s$ per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* commences at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this:—*If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 *hours. If greater than* 12 *hours, we subtract* 12 *hours from it, add* 1 *to the days, and write A. M.* For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M. civil time.

If the longitude from Greenwich be expressed in time, and, when *west*, *added* to the local time, or, when *east*, *subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h 0^m 0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before

Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1891, May 31, at a place whose longitude is 179° 40′, or $11^h\ 58^m\ 40^s$ east from Greenwich:

		h	m	s
Local apparent time . . .	May 31,	0	0	0
Longitude from Greenwich (subtractive)	. .	11	58	40
Greenwich apparent time . . .	May 30,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 30, or $11^h.978$ before Greenwich apparent noon on May 31.

On page 74 of the Ephemeris we find that the change of declination in one hour is

May 30, at Greenwich apparent noon . . .	22″.33
May 31, at Greenwich apparent noon . . .	21.38
Difference for one day	0.95

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 30th, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows:—

Difference for one hour, May 30	22″.33
Change for 0.25 of a day or 0″.95 × 0.25 . . .	0.24
Difference at 6 hours after noon	22.09

$$22''.09 \times 12.022 = 265''.6 = 4'\ 25''.6$$

	°	′	″
Declination at Greenwich noon, May 30 . . . N.	21	46	27.6
Change in 12.022 hours (additive) . . .		4	25.6
Sun's declination at time of observation . . . N.	21	50	53.2

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 31; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is 21″.63. Then, we find:—

	°	′	″
Declination at Greenwich noon, May 31 . . N.	21	55	12.3
Product of 21″.63 × 11.978 = 259″.1 (subtractive) .		4	19.1
Sun's declination at time of observation . . . N.	21	50	53.2

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table V of BOWDITCH's *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the center; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the center of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's center over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension*, and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first intrepolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently uesd when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required for finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^{s}.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table LI of BOWDITCH's *Navigator* may be used for the same purpose when only the nearest quarter of a second is required.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained: this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table LII of BOWDITCH's *Navigator*, will give the mean time required. This reduction may also be found by multiplying $9^{s}.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1891, May 15, $9^{h}\ 2^{m}\ 30^{s}$, A. M., mean time, at a place whose longitude is 100° 10′, or $6^{h}\ 40^{m}\ 40^{s}$, west of Greenwich.

		h m s
Local astronomical mean time	May 14,	21 2 30
Longitude from Greenwich (additive)		6 40 40
Greenwich mean time.	May 15,	3 43 10 = $3^{h}.7194$

Sun's Right Ascension.

	h	m	s
May 15, Greenwich noon .	3	27	53.30
H. D. $9^{s}.872 \times 3.7194$ . .	+ 0		36.72
	3	28	30.02

Equation of Time.

	m	s	
May 15, noon . .	3	48.99	(additive).
H. D. $-0^{s}.015 \times 3.72$	—	0.86	
	3	48.93	

In this case, the hourly differences interpolated to half the interval, or 1^{h}.9 after noon, have been used. The equation of time in this example is additive to mean time. Its reduction could also have been found by Table VI, A., of Bowditch's *Navigator*, but to seconds only.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 15, Sidereal Time (at Greenwich mean noon)	3	31	42.29
Hourly difference $9^{s}.8565 \times 3.7194$	+	0	36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^{h})	0	34	48.95

The reduction 0^{m} 36^{s}.66 could have been found in Table III corresponding to the Greenwich mean time 3^{h} 43^{m} 10^{s}. Also, by Table LI of Bowditch's *Navigator*, the reduction is 0^{m} 36^{s}.7.

3.—On 1891, May 15, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be 0^{h} 36^{m} 37^{s}.16, and that the corresponding mean time is required.

The astronomical day is May 14; the longitude in time, + 6^{h} 40^{m} 40^{s}, or + 6^{h}.678.

	h	m	s	
May 14, Sidereal Time (at Greenwich mean noon)	3	27	45.73	
The H. D. $9^{s}.8565 \times 6.678$, or the reduction for 6^{h} 40^{m} 40^{s} in Table III .	+	1	5.82	
The sidereal time of local mean noon	3	28	51.55	
The given sidereal time (+ 24^{h}, if necessary for the following subtraction) .	24	36	37.16	
Subtracting the first from the second gives the sidereal interval from noon .	21	7	45.61	= 21^{h}.12934
$-9^{s}.8296 \times 21.12934$, or the reduction for 21^{h} 7^{m} 45^{s}.61 in Table II . .	—	3	27.71	
The required astronomical mean time is . . . May 14,	21	4	17.90	

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January 0^{d}.0). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, — 9^{s}.8296. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or, approximately, from Table LII of Bowditch's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 13, that is the preceding astronomical day.

	h	m	s	
May 14, the mean time of Greenwich sidereal noon is . .	20	28	52.39	
The H. D. $-9^{s}.8296 \times 6.678$, or the reduction for long., Table II	—	1	5.64	
The mean time of local sidereal noon	20	27	46.75	
Add the given sidereal time	0	36	37.16	= 0^{h}.6103
The sum is	21	4	23.91	
$-9^{s}.8296 \times 0.6103$, or the reduction for 0^{h} 36^{m} 37^{s}.2 in Table II .	—	0	6.00	
The required astronomical mean time . . May 14,	21	4	17.91	

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272. It may also be obtained from Table XI of Bowditch's *Navigator*, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1891, May 21, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of May 21 is $4''.4$; then,

$$12^h : 10^h = 4''.4 : 3''.7,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for May 21, 10^h, is $15'\ 9''.3 + 3''.7$, or $15'\ 13''.0$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich*, which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place, may be computed. The reduction may be taken by simple inspection from Bowditch's Table XXVIII. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension*, and *Declination*, for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1891, May 1, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

	Right Ascension.		*Declination.*
	h m s		° ′ ″
May 1, 10^h	21 18 46.03		S. 20 50 45.9
Diff. $2^s.4162 \times 10.5$ . .	= + 25.37	$9''.682 \times 10.5$ =	+ 1 41.7
May 1, $10^h\ 10^m\ 30^s$ . . .	21 19 11.40		S. 20 49 4.2

The differences interpolated for $5^m.2 = 0^h.09$ are, for the right ascension $2^s.4146$, and for the declination $9''.739$, which may be used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator, subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. The Table of *Logarithms of small Arcs in Space or Time,* given at the end of the volume for 1871, saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1891, May 12, the corrected distance of the moon's centre from that of Regulus is 40° 3′: —

Corrected distance	40° 3′ 0″		
Distance in Ephemeris May 12, VI^h . . .	40 57 39	P. L.	0.2843
Difference	0 54 39	P. L.	0.5177
	h m s	P. L.	0.2334
Time from VI^h (*after*)	+1 45 10		
Corr. for 2d Diff., Table I	− 5		
Greenwich mean time May 12. . .	7 45 5		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus: —

From Ephemeris	P. L.	0.2843
Diff. of distances, 54′ 39″ = 3279″	log	3.5157
Red. of Greenwich time, 6310^s = 1^h 45^m 10^s	log	3.8000

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—263 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The last two columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the noon which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean noon of the day immediately following; in the case of Venus, Mars, Jupiter, and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 264—271 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan.* 0 give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January 0.

Pages 272—275 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Pages 276 and 277 contain the position of the moon's equator and the mean longitude of the moon, and a table for computing the libration of the moon. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 421.

Page 278 contains, for each tenth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox, and also the aberration and parallax of the sun. The column *Apparent Obliquity of the Ecliptic* (Hansen) gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude. The *Equation of Equinoxes* is really the astronomical nutation; that given *In Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The equation *In R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic.

The next column gives the *Precession of Equinoxes in Longitude*, from January 0 to each of the dates following. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax*, given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 280 contains the formulæ for reducing the positions of the fixed stars, using the notation of Bessel, and the constants of Peters and Struve. The formulæ by which the star-numbers are computed are also given.

Pages 281—284 contain the logarithms of the *Besselian Star-Numbers*, A, B, C, D, for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities A and B must be interchanged with the pair C and D; that is, A must be interchanged with C, and B with D. In the first column along with the solar day is given, for certain dates, the sidereal hour and tenth of midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of α *Hydræ for* 1891, *Feb.* 14, *for the upper transit at Washington.*

(Star-Catalogue)	log a	0.4699	log b	7.8696	log c	8.7161 n	log d	8.6313
(Page 281)	log A	9.2393 n	log B	0.5207 n	log C	1.1931 n	log D	1.0550
(Star-Catalogue)	log a'	1.1899 n	log b'	9.8030 n	log c'	9.7159	log d'	9.0413
	log Aa	9.7092 n	log Bb	8.3903 n	log Cc	9.9092	log Dd	9.6863
	log Aa'	0.4292	log Bb'	0.3237	log Cc'	0.9090 n	log Dd'	0.0963

		h	m	s			°	′	″
Mean Place, 1891.0, (page 296)	$\alpha_0 =$	9	22	13.874	$\delta_0 =$	—	8	11	11.26
	$Aa =$		—	.512	$Aa' =$			+	2.68
	$Bb =$		—	.024	$Bb' =$			+	2.11
	$Cc =$		+	.811	$Cc' =$			—	8.11
	$Dd =$		+	.486	$Dd' =$			+	1.25
	$E =$		—	.003	$\tau\mu' =$				0.00
	$\tau\mu =$			.000					
Apparent Place, 1891, *Feb.* 14,	$\alpha =$	9	22	14.632	$\delta =$	—	8	11	13.33

Pages 285—292 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of Bessel by the relations given on page 280, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d'. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of α Hydræ for 1891, *Feb.* 14, *for the upper transit at Washington.*

$\alpha_0 = 140^\circ\ 33'.5$ $\qquad \delta_0 = -\ 8^\circ\ 11'.2$

$G = 223^\circ\ 38'$ $\qquad G + \alpha_0 = 4^\circ\ 11'.5$

$H = 306\ \ 3$ $\qquad H + \alpha_0 = 86\ \ 36.5$

log $\frac{1}{15}$	8.8239	log $\frac{1}{15}$	8.8239	α_0 =	$9^h\ 22^m\ 13^s.874$
log g	0.6819	log h	1.2853	f =	− 0.536
log sin $(G+\alpha_0)$	8.8638	log sin $(H+\alpha_0)$	9.9992	(g) =	− 0.003
log tan δ_0	9.1579 n	log sec δ_0	0.0044	(h) =	+ 1.296
log (g)	7.5275 n	log (h)	0.1128	$\tau\mu$ =	.000
		Apparent R. A.,		α =	9 22 14.631
log g	0.6819	log h	1.2853	δ_0 = −	$8^\circ\ 11'\ 11''.26$
log cos $(G+\alpha_0)$	9.9988	log cos $(H+\alpha_0)$	8.7720	(g') =	+ 4.79
log (g')	0.6807	log sin δ_0	9.1535 n	(h') =	− 0.16
		log (h')	9.2108 n	(i) =	− 6.70
				$\tau\mu'$ =	0.00
		Apparent Dec.,		δ = −	8 11 13.33
log i	0.8306 n				
log cos δ_0	9.9955				
log (i)	0.2861 n				

Pages **293—301** contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1891, or the moment when the sun's mean longitude is 280°.

The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

In order that the list of mean places of stars may serve the purpose of a working-catalogue for the convenient use of astronomers, the position of each of the northern circumpolar stars is given in duplicate, one position being for the upper and the other for the lower culmination. The positions for the lower culmination are marked S. P. In this case, the right ascensions are the sidereal times at which the star crosses the lower meridian; and, in order to have the expresions for the co-ordinates congruous in all cases, the declinations are counted from the equator through the north pole, and therefore exceed 90°. The time of observation and the setting of the circle, in order to find a star on the meridian, are then obtained uniformly for all the stars.

Beginning with the volume of 1882, the number of stars has been greatly increased, in order to make the list more useful to field-astronomers. In order to show at a glance these additional stars, they are indicated in the list by an asterisk.

Pages 302—313 contain the apparent positions of the four north polar stars, α, δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. They include the terms depending on the moon's longitude. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found. and we wish to know whether it precedes or follows the upper transit of the same date. On page 302, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 308), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 314—364 contain, for every tenth upper transit at Washington, the apparent places of those stars of the preceding list which are not marked with an asterisk. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given, in small type, the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 365—376 contain the apparent right ascensions of all stars marked with an asterisk in the list of mean places. The apparent right ascension of each star is given only for that part of the year when it may readily be observed on the meridian. In the case of circumpolar stars, the right ascensions for lower, as well as upper, transit are given.

Pages 377—384 contain the apparent right ascension, declination, and semidiamter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 385—392 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated; and the one which is deficient is printed in smaller type. When the illumination is so nearly equal that no choice can be made between them, both are printed in large type.

Pages 393—408 contain the geocentric apparent right ascensions and declinations of the six major planets (Mars not being visible this year) and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington, which can be observed.

PART III—PHENOMENA.

This portion of *The American Ephemeris and Nautical Almanac* gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 410—414 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follow: —

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coinciden with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point, the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible, are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1891, June 6, begins and ends at Cape Farewell.

For the beginning we compare the distance of the place from the curves of 4^h and 5^h and we find it to correspond to about 11 minutes from the former, therefore the time of beginning is approximately $4^h\ 11^m$; for the end we compare the distance of the place from the curves of 5^h and 6^h and find it to be about 15 minutes from the latter, therefore the approximate time of end is $5^h\ 45^m$, both of which are probably correct to within 2 or 3 minutes. Changing to local mean time the result will be: —

		Beginning.			Ending.	
		d	h	m	h	m
Greenwich mean time	June	6	4	11	5	45
Longitude West			2	56	2	56
Local mean time	June	6	1	15	2	49

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows: —

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00302	2
5	0.00001	4	0.00300	3
10	0.00005	5	0.00297	5
15	0.00010	8	0.00292	8
20	0.00018	9	0.00284	9
25	0.00027	11	0.00275	11
30	0.00038	12	0.00264	12
35	0.00050	12	0.00252	13
40	0.00062	13	0.00239	13
45	0.00075	13	0.00226	13
50	0.00088	13	0.00213	12
55	0.00101	12	0.00201	12
60	0.00113	11	0.00189	11
65	0.00124	9	0.00178	9
70	0.00133	8	0.00169	8
75	0.00141	5	0.00161	6
80	0.00146	4	0.00155	3
85	0.00150	1	0.00152	1
90	0.00151		0.00151	

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.63992]\ \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\ \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\ \xi \sin d$$

ζ' is not wanted.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute we represent by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. But, simplicity will be gained by taking only that value of ψ for which cos ψ is positive. This value lies between the limits + 90° and − 90°. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one near that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. The computation for the first assumed time will give a small value of τ which, applied to the assumed time, will give a nearly correct time for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value of τ, to be applied to the assumed time for the end, and a large negative and inaccurate one to be subtracted for the beginning. We shall thus deduce two times of each phase only one of which is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

Theorem.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle,* $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{\text{m}}.001\ \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, further corrections and computations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$

For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90°$.

Computation of the Solar Eclipse of 1891, *June* 6, *for a point near Chicago.*

Latitude, $\varphi = +\ 40°\ 50'\ 1''$

Longitude, $\lambda = +\ 87°\ 36'\ 41''$

Constants for the given place:—

$\rho \sin \varphi' = 9.81317$

$\rho \cos \varphi' = 9.87947$

From the Eclipse Chart the approximate times of the phases are:—

		d	h	m	
Beginning	June	6	3	10	Greenwich Mean Time.
Ending	June	6	3	40	

	Beginning.	Ending.
Greenwich Mean Time,	$3^{\text{h}}\ 10^{\text{m}}$	$3^{\text{h}}\ 40^{\text{m}}$
μ	47° 53′.7	55° 23′.7
λ	87 36.7	87 36.7
$\mu-\lambda$	320 17	327 47
$\rho \cos \varphi'$	9.87947	9.87947
$\sin(\mu-\lambda)$	9.80550 *n*	9.72683 *n*
$\log \xi$	9.68497 *n*	9.60630 *n*
ξ	− 0.48414	− 0.40393

		Beginning.	Ending.
Greenwich Mean Time,		$3^h\ 10^m$	$3^h\ 40^m$
	$\rho \sin \varphi'$	9.81317	9.81317
	$\cos d$	9.96507	9.96507
		9.77824	9.77824
	(1)	+ 0.60012	+ 0.60012
	$\rho \cos \varphi'$	9.87947	9.87947
	$\sin d$	9.58597	9.58600
	$\cos(\mu-\lambda)$	9.88605	9.92739
		9.35149	9.39286
	(2)	+ 0.22464	+ 0.24710
(1)−(2)	η	+ 0.37548	+ 0.35302
	$\rho \sin \varphi'$	9.81317	9.81317
	$\sin d$	9.58597	9.58600
		9.39914	9.39917
	(3)	+ 0.25070	+ 0.25071
	$\rho \cos \varphi'$	9.87947	9.87947
	$\cos d$	9.96507	9.96507
	$\cos(\mu-\lambda)$	9.88605	9.92739
		9.73059	9.77193
	(4)	+ 0.53776	+ 0.59147
(3)+(4)	ζ	+ 0.78846	+ 0.84218
	const. log	7.63992	7.63992
	$\rho \cos \varphi' \cos(\mu-\lambda)$	9.76552	9.80686
	$\log \xi'$	7.40544	7.44678
	ξ'	+ 0.002543	+ 0.002797
	const. log	7.63992	7.63992
	$\xi \sin d$	9.27094 *n*	9.19230 *n*
	$\log \eta'$	6.91086 *n*	6.83222 *n*
	η'	− 0.000814	− 0.000679
	$x-\xi$	− 0.29790	− 0.11145
	$y-\eta$	+ 0.45747	+ 0.53568
	$x'-\xi'$	+ 0.006345	+ 0.006091
	$y'-\eta'$	+ 0.002674	+ 0.002536
	$m \sin M$	9.47407 *n*	9.04708 *n*
	$m \cos M$	9.66037	9.72890
	$\tan M$	9.81370 *n*	9.31818 *n*
	M	326° 55′ 43″	348° 14′ 49″
	$\sin M$	9.73694 *n*	9.30898 *n*
	$\log m$	9.73713	9.73810
	$n \sin N$	7.80243	7.78469
	$n \cos N$	7.42716	7.40415
	$\tan N$	0.37527	0.38054
	N	67° 8′ 52″	67° 23′ 43″
	$\cos N$	9.58923	9.58476
	$\log n$	7.83793	7.81939

		Beginning.	Ending.
Greenwich Mean Time,		$3^{h}\ 10^{m}$	$3^{h}\ 40^{m}$
	$\log \zeta$	9.89679	9.92541
	$\tan f$	7.66336	7.66336
		7.56015	7.58877
	$\zeta \tan f$	0.003632	0.003879
	l	0.547300	0.547370
	L	0.543668	0.543491
	$\sin (M-N)$	9.99306 n	9.99217 n
	$\log m$	9.73713	9.73810
	colog L	0.26467	0.26481
	$\sin \psi$	9.99486 n	9.99508 n
	ψ	− 81° 12′ 0″	− 81° 23′ 30″
	$\log \frac{m}{n}$	1.89920	1.91871
	$\cos (M-N)$	9.24899 n	9.27478
		1.14819 n	1.19349
	$-\frac{m}{n} \cos (M-N)$	$+\ 14^{m}.067$	$-\ 15^{m}.613$
	$\log L$	9.73533	9.73519
	$\cos \psi$	9.18465	9.17516
	colog n	2.16207	2.18061
		1.08205	1.09096
	$\frac{L \cos \psi}{n}$	$+\ 12^{m}.079$	$+\ 12^{m}.330$
	τ	$+\ 1^{m}.988$	$-\ 3^{m}.283$
		d h m	h m
	T	June 6 3 10.000	3 40.000
	t	June 6 3 11.988	3 36.717
	λ	5 50.445	5 50.445
Local Mean Time		June 5 21 21.543	21 46.272

Therefore we have finally

		d	h	m	s	
Beginning of the eclipse	June	5	21	21	32.6	Local Mean Time.
End of the eclipse	June	5	21	46	16.3	

Angle of position:

	°	′		°	′
N	67	8.8		67	23.7
ϕ (+ 180)	261	12.0	−	81	23.5
P	328	20.8		346	0.2

from the north point of the sun's limb toward the east.

Elements of Occultations.—Pages 416—443 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1891.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1891 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed with three or four places of decimals by the formulæ,

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$
$$\rho \cos \varphi' = F \cos \varphi$$

already given in connection with the eclipses.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington.*

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. DOWNES's table, on pages 444—445. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ' and τ from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$
$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{2} h_0)$$
$$\tau = \frac{\xi_0}{x' - \xi'}$$

τ will then be the approximate interval between the times of geocentric and local conjunction.

By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$\tau_1 = \tau - 0^h.5$
$\tau_2 = \tau + 0^h.5$
T, the Washington mean time of geocentric conjunction in R. A.
d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations.

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' = \frac{n}{60} &= [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If log $m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi\,[m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter

$$\pi\,[m \sin (M - N) - 0.2723]\,[1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ: —

$$P = N - \psi \qquad \text{for immersion,}$$

$$P = N + \psi \pm 180^\circ \qquad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits ± 90°.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we will compute that of ϵ Geminorum, on Feb. 18 1891, for the University of Virginia, whose position is

$$\varphi = + 38^\circ\ 2'\ 1''.2$$

$$\lambda = + \ 0^{\text{h}}\ 5^{\text{m}}\ 53^{\text{s}}.18$$

Constants for the given place,

$$\rho \sin \varphi' = 9.78730$$

$$\rho \cos \varphi' = 9.89689$$

From the table of elements, page 419, we have

$$H = + \ 0^{\text{h}}\ 1^{\text{m}}.1$$

$$h_0 = H - \lambda = - \ 0^{\text{h}}\ 4^{\text{m}}.786$$

From DOWNES's Table, pages 444—445, or from the formulæ on page 504, we find the correction to the Washington mean time of geocentric conjunction, as given on page 419, to be $-2^{\text{m}}.8$, therefore the Washington mean time of apparent conjunction at the given place is Feb. $18^{\text{d}}\ 8^{\text{h}}\ 40^{\text{m}}.6$.

Since the given place is not far from the centre of the area of visibility we shall assume the duration to be 1 hour and 30 minutes, therefore, by first subtracting and then adding 45 minutes, we shall have the approximate Washington mean times of immersion and emersion to be used in the computation, thus:

$$\tau_1 = - \ 0^{\text{h}}\ 47^{\text{m}}.8 \qquad T + \tau_1 = \text{Feb. 18, } 7^{\text{h}}\ 55^{\text{m}}.6$$

$$\tau_2 = + \ 0^{\text{h}}\ 42^{\text{m}}.2 \qquad T + \tau_2 = \text{Feb. 18, } 9^{\text{h}}\ 25^{\text{m}}.6$$

		Immersion.	Emersion.
		h m	h m
Washington Mean Time,	Feb. 18,	7 55.6	9 25.6
	h_0	− 0 4.786	− 0 4.786
	τ (in sidereal time)	− 0 47.931	+ 0 42.315
	$h_0 + \tau$	− 0 52.717	+ 0 37.529
	$h_0 + \tau$ (in arc)	− 13° 10′ 45″	+ 9° 22′ 56″
	$\rho \cos \varphi'$	9.89689	9.89689
	$\sin (h_0 + \tau)$	9.35792 n	9.21225
	$\log \xi$	9.25481 n	9.10914
	ξ	− 0.17981	+ 0.12857

		Immersion.	Emersion.
Washington Mean Time,	Feb. 18,	$7^h\ 55^m.6$	$9^h\ 25^m.6$
	$\rho \sin \varphi'$	9.78730	9.78730
	$\cos d$	9.95643	9.95643
		9.74373	9.74373
	(1)	+ 0.55429	+ 0.55429
	$\rho \cos \varphi'$	9.89689	9.89689
	$\sin d$	9.62980	9.62980
	$\cos (h_0 + \tau)$	9.98841	9.99415
		9.51510	9.52084
	(2)	+ 0.32742	+ 0.33177
(1)−(2)	η	+ 0.22687	+ 0.22252
	const. log	9.41920	9.41920
	$\rho \cos \varphi' \cos (h_0 + \tau)$	9.88530	9.89104
	$\log \xi'$	9.30450	9.31024
	ξ'	+ 0.20160	+ 0.20428
	const. log	9.41920	9.41920
	$\xi \sin d$	8.88461 *n*	8.73894
	$\log \eta'$	8.30381 *n*	8.15814
	η'	− 0.02013	+ 0.01439
	$\log x'$	9.74382	9.74382
	$\log \tau$	9.90128 *n*	9.84716
	$\log x$	9.64510 *n*	9.59098
	x	− 0.44167	+ 0.38993
	$\log y'$	7.88081	7.88081
	$\log \tau$	9.90128 *n*	9.84716
		7.78209 *n*	7.72797
	$y' \tau$	− 0.006055	+ 0.005345
	Y	+ 0.249100	+ 0.249100
	$Y + y' \tau = y$	+ 0.243045	+ 0.254445
	$x - \xi$	− 0.26186	+ 0.26136
	$y - \eta$	+ 0.01617	+ 0.03192
	$x' - \xi'$	+ 0.35280	+ 0.35012
	$y' - \eta'$	+ 0.02773	− 0.00679
	$m \sin M$	9.41807 *n*	9.41724
	$m \cos M$	8.20871	8.50406
	$\tan M$	1.20936 *n*	0.91318
	M	273° 32′ 1″	83° 2′ 13″
	$\cos M$	8.78982	9.08362
	$\log m$	9.41889	9.42044
	$n \sin N$	9.54753	9.54421
	$n \cos N$	8.44295	7.83187 *n*
	$\tan N$	1.10458	1.71234 *n*
	N	85° 30′ 21″	91° 6′ 40″
	$\cos N$	8.89408	8.28760 *n*
	$\log n$	9.54887	9.54427
	colog 60	8.22185	8.22185
	$\log n'$	7.77072	7.76612

			Immersion.		Emersion.
Washington Mean Time,	Feb. 18,		$7^h 55^m.6$		$9^h 25^m.6$
	const. log		0.56500		0.56500
	$\log m$		9.41889		9.42044
	$\sin (M - N)$		9.14504 n		9.14754 n
	$\sin \psi$		9.12893 n		9.13298 n
	ψ	−	7° 44′ 0″	−	7° 48′23″
	$\log \frac{m}{n'}$		1.64817		1.65432
	$\cos (M - N)$		9.99573 n		9.99567
			1.64390 n		1.64999
	$-\frac{m}{n} \cos (M - N)$	+	$\overset{m}{44.045}$	−	$\overset{m}{44.667}$
	const. log		9.43500		9.43500
	co-log n'		2.22928		2.23388
	$\cos \psi$		9.99603		9.99596
			1.66031		1.66484
	$\frac{[9.43500]}{n'} \cos \psi$	+	$\overset{m}{45.741}$	+	$\overset{m}{46.221}$
	t_1	−	1.696	+	1.554
			$\overset{h}{7}$ 55.600		$\overset{h}{9}$ 25.600
Washington mean time of phase,	Feb. 18,		7 53.904		9 27.154
	λ	+	0 5.886		0 5.886
University of Virginia mean time,	Feb. 18,		7 48.018		9 21.268
Angle of position:					
	N		85° 30′.3		91° 6′.7
	ψ (+ 180°)	−	7 44.0	−	7 48.4
	P		93 14.3		263 18.3

from the north point of the moon's limb toward the east.

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 416—443, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \qquad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h = x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1+\frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2} \tau \cos (h_0 + \tfrac{1}{2} \tau) \tag{1}$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \tag{2}$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916]\, \rho \cos \varphi' \cos h \end{aligned} \tag{3}$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \tag{4}$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by comparing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all the intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2} \tau &= 50^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2} \tau &= 40^{\mathrm{m}} \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \tag{5}$$

or, the approximate values of τ may be taken from Mr. DOWNES's table, pages 444—445. It will be best to make the computation for every 30^{m} of h_0, and to find the intermediate values of τ for every 10^{m} by interpolation. Then for each 30^{m} of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and $\log \xi$ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^{m} from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.60$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h. It is a mere question of convenience whether to compute the table for negative values of d, since by putting

$$\begin{aligned}\eta_1 &= \rho \sin \varphi' \cos d \\ \eta_2 &= -\rho \cos \varphi' \sin d \cos h\end{aligned}$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits ± 0.28, it is almost certain that there will be an occultation. If it falls without the limits ± 0.33, it is almost certain that there will not be an occultation. Between the years 1881 and 1891 these last limits may be reduced to ± 0.32, and cases near this limit may be rejected if y' is small. A convenient rule to adopt will be—

$$\begin{array}{rl} y' < 0.10, & = \pm 0.29 \\ 0.10 < y' < 0.15, & = \pm 0.30 \\ 0.15 < y' < 0.20, & = \pm 0.31 \\ 0.20 < y' & = \pm 0.33 \text{ or } \pm 0.32 \end{array}$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and Δ from the equations

$$\begin{aligned} v \sin Q &= y' - \eta' \\ v \cos Q &= x' - \xi' \\ \Delta &= (y - \eta) \cos Q \end{aligned}$$

If $\Delta > 0.2723$ or $\log \Delta > 9.4350$ there will be no occultation, though the moon may graze the star when $\Delta - 0.2723$ is very small. If $\Delta < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\Delta}{0.2723} \qquad (P < 180^\circ)$$

$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$
Position-angle from north toward east at immersion, $180^\circ - Q - P$
Position-angle from north toward east at emersion, $180^\circ - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and, passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H-\lambda$ or $T-\lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 446—479.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness.

Disks of Mercury and Venus, pages 446—447.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites of Jupiter, pages 449—473.—The times of phenomena are explained at the foot of each page; the diagram is on page 449.

Phenomena, pages 480—481.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0°, 90° or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 18^m.9$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 302—313 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1891.

The adopted constants of precession, nutation, and aberration are those of Struve and Peters, namely:—

$$\begin{aligned}\text{Precession} &= 50''.2411 + 0''.0002268\ t\\ \text{Nutation} &= 9''.2231 + 0''.000009\ t\\ \text{Aberration} &= 20''.4451\end{aligned}$$

in which t is the number of years after 1800.0.

The obliquity of the ecliptic is that of Hansen's *Tables du Soleil*, which is $0''.31$ greater than that of Peters, given in the issues of this Ephemeris preceding that for 1882. A comparison of Hansen's mean obliquity with that of Peters and of Le Verrier at different epochs is given in the following table:—

Epoch.	Hansen.	Peters.	Le Verrier.	H.—P.	H.—L.
	° ′ ″	″	″	″	″
1750	23 28 18.19	17.44	19.42	+0.75	—1.23
1800	23 27 54.80	54.22	55.63	+0.58	—0.83
1850	23 27 31.42	30.99	31.83	+0.43	—0.41
1900	23 27 8.02	7.76	8.03	+0.26	—0.01

The formulæ for reducing the places of the fixed stars, page 280, correspond to the *Star Tables of the American Ephemeris*, Washington, 1869.

The mean right ascensions of stars have been reduced to Newcomb's fundamental standard in the catalogue attached to the *Washington Observations for* 1870, Appendix II, with the following exceptions: The right ascensions of the 48 circumpolar stars north of 60° north declination are from Dr. Gould's *Standard Places of Fundamental Stars*, second edition, United States Coast Survey Office, 1866. Of the twelve stars south of 50° south declination, the positions of β Hydri, α Trianguli Australis, and σ Octantis, have been corrected from data furnished by Dr. Gould; while the remaining nine are, as before, from the *British Nautical Almanac* for 1848.

The right ascensions of the additional stars in the general list, whose apparent right ascensions are given in a subsequent section, have been taken partly from the *Catalogue of* 1098 *Standard Clock and Zodiacal Stars*, forming Part IV of Vol. I of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac*, Washington, 1881; and partly from the catalogue of the Astronomische Gesellschaft of 1878. A few have been derived from recent catalogues without a rigorous reduction for equinox.

The mean declinations of stars are taken from Boss's paper in the *Report of the Northern Boundary Commission*, Washington, 1879, for all stars found therein. The declinations of all the other stars have been reduced to the same standard, except those of the additional ones above, which have been taken partly from the Astronomische Gesellschaft list, and partly from places in recent catalogues. To the apparent places of Sirius and Procyon have been applied the periodic corrections resulting from Auwers's investigations.

The values of these corrections are:—

Year.	Sirius.		Procyon.	
1891.0	$\Delta\alpha = +0^{s}.133$	$\Delta\delta = -0''.14$	$\Delta\alpha = +0^{s}.053$	$\Delta\delta = +0''.69$
1892.0	$\Delta\alpha = +0.148$	$\Delta\delta = +0.28$	$\Delta\alpha = +0.060$	$\Delta\delta = +0.55$

The ephemeris of the sun is constructed from **Hansen** *and* **Olufsen**'s *Tables du Soleil*, Copenhagen, 1853, except that **Struve**'s aberration has been used. This is equivalent to adding 0″.19 to the true longitudes, but it does not affect the right ascensions and declinations. The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$X = R \cos \lambda$$
$$Y = R \sin \lambda \cos \omega - 19.3\, R\, \beta$$
$$Z = R \sin \lambda \sin \omega + 44.5\, R\, \beta$$

The reductions to mean equinox, 1891.0, are computed by the formulæ,

$$\Delta X' = + Y \sec \omega\, \Delta \lambda \sin 1''$$
$$\Delta Y' = - X \cos \omega\, \Delta \lambda \sin 1'' + Z\, \Delta \omega \sin 1'' - \ \ 9.4\, \tau\, R \sin (\lambda + 187^\circ)$$
$$\Delta Z' = - X \sin \omega\, \Delta \lambda \sin 1'' - Y\, \Delta \omega \sin 1'' + 21.7\, \tau\, R \sin (\lambda + 187^\circ)$$

Wherein—

λ and β are the longitude and latitude of the sun referred to the equinox and ecliptic of the date;
ω, the obliquity of the ecliptic;
$\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
$\Delta \omega$, the reduction of the mean to the apparent obliquity;
τ, the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals. The correction for latitude has been taken from **Goetze**'s paper in the *Astronomical Journal*, Vol. II, page 71.

The mean equatorial horizontal parallax of the sun, adopted from Professor **Newcomb**'s *Investigation of the Distance of the Sun and the Elements which depend on it*,* is 8″.848. The adopted semidiameter of the sun at the earth's mean distance is 16′ 2″. In the computations pertaining to eclipses, **Bessel**'s semidiameter, 15′ 59″.788 has been used.

The right ascension, declination and parallax of the moon are derived from **Hansen**'s *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with **Newcomb**'s *Researches on the Motion of the Moon*, Part I, page 268,† and a corrected table being substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2″.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemeris of Mercury is derived from Professor **Winlock**'s *Tables of Mercury*, Washington, 1864. They are based on the older theory of **Le Verrier**, published in the Additions to the *Connaissance des Temps* for 1848.

The ephemeris of Venus is derived from Mr. G. W. **Hill**'s *Tables of Venus*, Washington, 1872.

The ephemeris of Mars is derived from manuscript tables constructed from **Lindenau**'s Tables. Mr. **Hugh Breen**'s results, contained in his paper *On the Corrections of* **Lindenau**'s *Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX, have also been discussed and applied; and **Le Verrier**'s secular variations of the elements are likewise adopted. The perturbations produced by Jupiter have been increased by $\frac{1}{50}$ of their value. The following are the corresponding corrected elements and annual variations for Washington, 1855.0:—

$$\begin{array}{lcrcrl}
L & = & 320^\circ\ 13'\ 33''.87 & + & 689101''.1527 & t \\
\pi & = & 333\ \ 23\ \ 17.84 & + & 65.9990 & t \\
\Omega & = & 48\ \ 25\ \ 55.29 & + & 27.6997 & t \\
i & = & 1\ \ 51\ \ \ 2.20 & - & 0.02141 & t \\
e & = & 19238''.75 & + & 0.18549 & t \\
n & = & 689050''.8927 & & & \\
a & = & 1.5236915 & & &
\end{array}$$

The ephemeris of Jupiter is derived from manuscript tables constructed from **Bouvard**'s Tables, with such changes as were required to make them correspond more nearly to the formulæ.

The ephemeris of Saturn is derived from a provisional theory constructed by Mr. **George W. Hill**, and still unpublished.

The ephemerides of Uranus and Neptune are derived from Professor **Newcomb**'s Tables, published by the *Smithsonian Institution*.

---

* *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1865, Appendix II.

† *Astronomical Observations made at the U. S. Naval Observatory, Washington*, 1875, Appendix II

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3″.34	0.00	Le Verrier, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	Peirce, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the sun and occultations of stars by the moon are adapted to Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.* The adopted semidiameters are:—

Semidiameter of the sun at distance unity. . . .	959″.788
Ratio of radius of moon to radius of earth . . .	0.27227

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables* Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor Newcomb, except those of Titan, Hyperion, and Iapetus.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor Newcomb's *Uranian and Neptunian Systems,* Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from Bessel's elements of the terrestrial spheroid, as adopted in Table III of Chauvenet's *Spherical and Practical Astronomy,* Vol. II:—

$$\log e = 8.9122052$$
$$\varphi' - \varphi = -11' 30''.65 \sin 2\varphi + 1''.16 \sin 4\varphi$$
$$\log \rho = 9.9992747 + 0.0007271 \cos 2\varphi - 0.0000018 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.

(2) A declination of Polaris equal to + 88° 43′.

The principal computations of the Ephemeris have been distributed in the following manner:—

The ephemeris of the Sun was computed by the late Mr. Eastwood; the Moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; the right ascension and declination, by Professor Van Vleck; the culminations, by Mr. Loomis and Mr. Meier; the lunar distances, by Mr. Bradford; Mercury and Venus, by Mr. E. P. Austin; Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. Roberdeau Buchanan; Jupiter's satellites, by Professor H. D. Todd; the satellites of Saturn, Uranus, and Neptune, by Dr. Morrison. The mean and apparent places of the fixed stars were prepared by Mr. Meier and Mr. Hedrick; the general constants for their reduction, by Mr. Buchanan; the occultations, by Mr. J. O. Wiessner; and the eclipses were computed and the charts projected by Mr. Buchanan.

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																									
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

		Difference of the Proportional Logarithms in the Ephemeris.																							
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

		Difference of the Proportional Logarithms in the Ephemeris.																		
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$0^{h.}$		$1^{h.}$		$2^{h.}$		$3^{h.}$		$4^{h.}$		$5^{h.}$		$6^{h.}$		$7^{h.}$		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.830	0	19.659	0	29.459	0	39.318	0	49.148	0	58.977	1	8.807	0	0.000
1	0	0.164	0	9.993	0	19.823	0	29.653	0	39.482	0	49.312	0	59.141	1	8.971	1	0.003
2	0	0.328	0	10.157	0	19.987	0	29.816	0	39.646	0	49.475	0	59.305	1	9.135	2	0.005
3	0	0.491	0	10.321	0	20.151	0	29.980	0	39.810	0	49.639	0	59.469	1	9.298	3	0.008
4	0	0.655	0	10.485	0	20.314	0	30.144	0	39.974	0	49.803	0	59.633	1	9.462	4	0.011
5	0	0.819	0	10.649	0	20.478	0	30.308	0	40.137	0	49.967	0	59.796	1	9.626	5	0.014
6	0	0.983	0	10.813	0	20.642	0	30.472	0	40.301	0	50.131	0	59.960	1	9.790	6	0.016
7	0	1.147	0	10.976	0	20.806	0	30.635	0	40.465	0	50.295	1	0.124	1	9.954	7	0.019
8	0	1.311	0	11.140	0	20.970	0	30.799	0	40.629	0	50.458	1	0.288	1	10.118	8	0.022
9	0	1.474	0	11.304	0	21.134	0	30.963	0	40.793	0	50.622	1	0.452	1	10.281	9	0.025
10	0	1.638	0	11.468	0	21.297	0	31.127	0	40.956	0	50.786	1	0.616	1	10.445	10	0.027
11	0	1.802	0	11.632	0	21.461	0	31.291	0	41.120	0	50.950	1	0.779	1	10.609	11	0.030
12	0	1.966	0	11.795	0	21.625	0	31.455	0	41.284	0	51.114	1	0.943	1	10.773	12	0.033
13	0	2.130	0	11.959	0	21.789	0	31.618	0	41.448	0	51.278	1	1.107	1	10.937	13	0.035
14	0	2.294	0	12.123	0	21.953	0	31.782	0	41.612	0	51.441	1	1.271	1	11.100	14	0.038
15	0	2.457	0	12.287	0	22.117	0	31.946	0	41.776	0	51.605	1	1.435	1	11.264	15	0.041
16	0	2.621	0	12.451	0	22.280	0	32.110	0	41.939	0	51.769	1	1.599	1	11.428	16	0.044
17	0	2.785	0	12.615	0	22.444	0	32.274	0	42.103	0	51.933	1	1.762	1	11.592	17	0.046
18	0	2.949	0	12.778	0	22.608	0	32.438	0	42.267	0	52.097	1	1.926	1	11.756	18	0.049
19	0	3.113	0	12.942	0	22.772	0	32.601	0	42.431	0	52.260	1	2.090	1	11.920	19	0.052
20	0	3.277	0	13.106	0	22.936	0	32.765	0	42.595	0	52.424	1	2.254	1	12.083	20	0.055
21	0	3.440	0	13.270	0	23.099	0	32.929	0	42.759	0	52.588	1	2.418	1	12.247	21	0.057
22	0	3.604	0	13.434	0	23.263	0	33.093	0	42.922	0	52.752	1	2.582	1	12.411	22	0.060
23	0	3.768	0	13.598	0	23.427	0	33.257	0	43.086	0	52.916	1	2.745	1	12.575	23	0.063
24	0	3.932	0	13.761	0	23.591	0	33.420	0	43.250	0	53.080	1	2.909	1	12.739	24	0.066
25	0	4.096	0	13.925	0	23.755	0	33.584	0	43.414	0	53.243	1	3.073	1	12.903	25	0.068
26	0	4.259	0	14.089	0	23.919	0	33.748	0	43.578	0	53.407	1	3.237	1	13.066	26	0.071
27	0	4.423	0	14.253	0	24.082	0	33.912	0	43.742	0	53.571	1	3.401	1	13.230	27	0.074
28	0	4.587	0	14.417	0	24.246	0	34.076	0	43.905	0	53.735	1	3.564	1	13.394	28	0.076
29	0	4.751	0	14.581	0	24.410	0	34.240	0	44.069	0	53.899	1	3.728	1	13.558	29	0.079
30	0	4.915	0	14.744	0	24.574	0	34.403	0	44.233	0	54.063	1	3.892	1	13.722	30	0.082
31	0	5.079	0	14.908	0	24.738	0	34.567	0	44.397	0	54.226	1	4.056	1	13.886	31	0.085
32	0	5.242	0	15.072	0	24.902	0	34.731	0	44.561	0	54.390	1	4.220	1	14.049	32	0.087
33	0	5.406	0	15.236	0	25.065	0	34.895	0	44.724	0	54.554	1	4.384	1	14.213	33	0.090
34	0	5.570	0	15.400	0	25.229	0	35.059	0	44.888	0	54.718	1	4.547	1	14.377	34	0.093
35	0	5.734	0	15.563	0	25.393	0	35.223	0	45.052	0	54.882	1	4.711	1	14.541	35	0.096
36	0	5.898	0	15.727	0	25.557	0	35.386	0	45.216	0	55.046	1	4.875	1	14.705	36	0.098
37	0	6.062	0	15.891	0	25.721	0	35.550	0	45.380	0	55.209	1	5.039	1	14.868	37	0.101
38	0	6.225	0	16.055	0	25.885	0	35.714	0	45.544	0	55.373	1	5.203	1	15.032	38	0.104
39	0	6.389	0	16.219	0	26.048	0	35.878	0	45.707	0	55.537	1	5.367	1	15.196	39	0.106
40	0	6.553	0	16.383	0	26.212	0	36.042	0	45.871	0	55.701	1	5.530	1	15.360	40	0.109
41	0	6.717	0	16.546	0	26.376	0	36.206	0	46.035	0	55.865	1	5.694	1	15.524	41	0.112
42	0	6.881	0	16.710	0	26.540	0	36.369	0	46.199	0	56.028	1	5.858	1	15.688	42	0.115
43	0	7.045	0	16.874	0	26.704	0	36.533	0	46.363	0	56.192	1	6.022	1	15.851	43	0.117
44	0	7.208	0	17.038	0	26.867	0	36.697	0	46.527	0	56.356	1	6.186	1	16.015	44	0.120
45	0	7.372	0	17.202	0	27.031	0	36.861	0	46.690	0	56.520	1	6.350	1	16.179	45	0.123
46	0	7.536	0	17.366	0	27.195	0	37.025	0	46.854	0	56.684	1	6.513	1	16.343	46	0.126
47	0	7.700	0	17.529	0	27.359	0	37.188	0	47.018	0	56.848	1	6.677	1	16.507	47	0.128
48	0	7.864	0	17.693	0	27.523	0	37.352	0	47.182	0	57.011	1	6.841	1	16.671	48	0.131
49	0	8.027	0	17.857	0	27.687	0	37.516	0	47.346	0	57.175	1	7.005	1	16.834	49	0.134
50	0	8.191	0	18.021	0	27.850	0	37.680	0	47.510	0	57.339	1	7.169	1	16.998	50	0.137
51	0	8.355	0	18.185	0	28.014	0	37.844	0	47.673	0	57.503	1	7.332	1	17.162	51	0.139
52	0	8.519	0	18.349	0	28.178	0	38.008	0	47.837	0	57.667	1	7.496	1	17.326	52	0.142
53	0	8.683	0	18.512	0	28.342	0	38.171	0	48.001	0	57.831	1	7.660	1	17.490	53	0.145
54	0	8.847	0	18.676	0	28.506	0	38.335	0	48.165	0	57.994	1	7.824	1	17.654	54	0.147
55	0	9.010	0	18.840	0	28.670	0	38.499	0	48.329	0	58.158	1	7.988	1	17.817	55	0.150
56	0	9.174	0	19.004	0	28.833	0	38.663	0	48.492	0	58.322	1	8.152	1	17.981	56	0.153
57	0	9.338	0	19.168	0	28.997	0	38.827	0	48.656	0	58.486	1	8.315	1	18.145	57	0.156
58	0	9.502	0	19.331	0	29.161	0	38.991	0	48.820	0	58.650	1	8.479	1	18.309	58	0.158
59	0	9.666	0	19.495	0	29.325	0	39.154	0	48.984	0	58.814	1	8.643	1	18.473	59	0.161
Side-real.	$0^{h.}$		$1^{h.}$		$2^{h.}$		$3^{h.}$		$4^{h.}$		$5^{h.}$		$6^{h.}$		$7^{h.}$		For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	

EPH 91—33—7

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.234	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^{h}.		1^{h}.		2^{h}.		3^{h}.		4^{h}.		5^{h}.		6^{h}.		7^{h}.		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.856	0	19.713	0	29.569	0	39.426	0	49.282	0	59.139	1	8.995	0	0.000
1	0	0.164	0	10.021	0	19.877	0	29.734	0	39.590	0	49.447	0	59.303	1	9.160	1	0.003
2	0	0.329	0	10.185	0	20.041	0	29.898	0	39.754	0	49.611	0	59.467	1	9.324	2	0.005
3	0	0.493	0	10.349	0	20.206	0	30.062	0	39.919	0	49.775	0	59.632	1	9.488	3	0.008
4	0	0.657	0	10.514	0	20.370	0	30.227	0	40.083	0	49.939	0	59.796	1	9.652	4	0.011
5	0	0.821	0	10.678	0	20.534	0	30.391	0	40.247	0	50.104	0	59.960	1	9.817	5	0.014
6	0	0.986	0	10.842	0	20.699	0	30.555	0	40.412	0	50.268	1	0.124	1	9.981	6	0.016
7	0	1.150	0	11.006	0	20.863	0	30.719	0	40.576	0	50.432	1	0.289	1	10.145	7	0.019
8	0	1.314	0	11.171	0	21.027	0	30.864	0	40.740	0	50.597	1	0.453	1	10.310	8	0.022
9	0	1.478	0	11.335	0	21.191	0	31.048	0	40.904	0	50.761	1	0.617	1	10.474	9	0.025
10	0	1.643	0	11.499	0	21.356	0	31.212	0	41.069	0	50.925	1	0.782	1	10.638	10	0.027
11	0	1.807	0	11.663	0	21.520	0	31.376	0	41.233	0	51.089	1	0.946	1	10.802	11	0.030
12	0	1.971	0	11.828	0	21.684	0	31.541	0	41.397	0	51.254	1	1.110	1	10.967	12	0.033
13	0	2.136	0	11.992	0	21.849	0	31.705	0	41.561	0	51.418	1	1.274	1	11.131	13	0.036
14	0	2.300	0	12.156	0	22.013	0	31.869	0	41.726	0	51.582	1	1.439	1	11.295	14	0.038
15	0	2.464	0	12.321	0	22.177	0	32.034	0	41.890	0	51.746	1	1.603	1	11.459	15	0.041
16	0	2.628	0	12.485	0	22.341	0	32.198	0	42.054	0	51.911	1	1.767	1	11.624	16	0.044
17	0	2.793	0	12.649	0	22.506	0	32.362	0	42.219	0	52.075	1	1.932	1	11.788	17	0.047
18	0	2.957	0	12.813	0	22.670	0	32.526	0	42.383	0	52.239	1	2.096	1	11.952	18	0.049
19	0	3.121	0	12.978	0	22.834	0	32.691	0	42.547	0	52.404	1	2.260	1	12.117	19	0.052
20	0	3.285	0	13.142	0	22.998	0	32.855	0	42.711	0	52.568	1	2.424	1	12.281	20	0.055
21	0	3.450	0	13.306	0	23.163	0	33.019	0	42.876	0	52.732	1	2.589	1	12.445	21	0.057
22	0	3.614	0	13.471	0	23.327	0	33.183	0	43.040	0	52.896	1	2.753	1	12.609	22	0.060
23	0	3.778	0	13.635	0	23.491	0	33.348	0	43.204	0	53.061	1	2.917	1	12.774	23	0.063
24	0	3.943	0	13.799	0	23.656	0	33.512	0	43.368	0	53.225	1	3.081	1	12.938	24	0.066
25	0	4.107	0	13.963	0	23.820	0	33.676	0	43.533	0	53.389	1	3.246	1	13.102	25	0.068
26	0	4.271	0	14.128	0	23.984	0	33.841	0	43.697	0	53.554	1	3.410	1	13.266	26	0.071
27	0	4.435	0	14.292	0	24.148	0	34.005	0	43.861	0	53.718	1	3.574	1	13.431	27	0.074
28	0	4.600	0	14.456	0	24.313	0	34.169	0	44.026	0	53.882	1	3.739	1	13.595	28	0.077
29	0	4.764	0	14.620	0	24.477	0	34.333	0	44.190	0	54.046	1	3.903	1	13.759	29	0.079
30	0	4.928	0	14.785	0	24.641	0	34.498	0	44.354	0	54.211	1	4.067	1	13.924	30	0.082
31	0	5.093	0	14.949	0	24.805	0	34.662	0	44.518	0	54.375	1	4.231	1	14.088	31	0.085
32	0	5.257	0	15.113	0	24.970	0	34.826	0	44.683	0	54.539	1	4.396	1	14.252	32	0.088
33	0	5.421	0	15.278	0	25.134	0	34.990	0	44.847	0	54.703	1	4.560	1	14.416	33	0.090
34	0	5.585	0	15.442	0	25.298	0	35.155	0	45.011	0	54.868	1	4.724	1	14.581	34	0.093
35	0	5.750	0	15.606	0	25.463	0	35.319	0	45.176	0	55.032	1	4.888	1	14.745	35	0.096
36	0	5.914	0	15.770	0	25.627	0	35.483	0	45.340	0	55.196	1	5.053	1	14.909	36	0.099
37	0	6.078	0	15.935	0	25.791	0	35.648	0	45.504	0	55.361	1	5.217	1	15.073	37	0.101
38	0	6.242	0	16.099	0	25.955	0	35.812	0	45.668	0	55.525	1	5.381	1	15.238	38	0.104
39	0	6.407	0	16.263	0	26.120	0	35.976	0	45.833	0	55.689	1	5.546	1	15.402	39	0.107
40	0	6.571	0	16.427	0	26.284	0	36.140	0	45.997	0	55.853	1	5.710	1	15.566	40	0.110
41	0	6.735	0	16.592	0	26.448	0	36.305	0	46.161	0	56.018	1	5.874	1	15.731	41	0.112
42	0	6.900	0	16.756	0	26.612	0	36.469	0	46.325	0	56.182	1	6.038	1	15.895	42	0.115
43	0	7.064	0	16.920	0	26.777	0	36.633	0	46.490	0	56.346	1	6.203	1	16.059	43	0.118
44	0	7.228	0	17.085	0	26.941	0	36.798	0	46.654	0	56.510	1	6.367	1	16.223	44	0.120
45	0	7.392	0	17.249	0	27.105	0	36.962	0	46.818	0	56.675	1	6.531	1	16.388	45	0.123
46	0	7.557	0	17.413	0	27.270	0	37.126	0	46.983	0	56.839	1	6.695	1	16.552	46	0.126
47	0	7.721	0	17.577	0	27.434	0	37.290	0	47.147	0	57.003	1	6.860	1	16.716	47	0.129
48	0	7.885	0	17.742	0	27.598	0	37.455	0	47.311	0	57.168	1	7.024	1	16.881	48	0.131
49	0	8.049	0	17.906	0	27.762	0	37.619	0	47.475	0	57.332	1	7.188	1	17.045	49	0.134
50	0	8.214	0	18.070	0	27.927	0	37.783	0	47.640	0	57.496	1	7.353	1	17.209	50	0.137
51	0	8.378	0	18.234	0	28.091	0	37.947	0	47.804	0	57.660	1	7.517	1	17.373	51	0.140
52	0	8.542	0	18.399	0	28.255	0	38.112	0	47.968	0	57.825	1	7.681	1	17.538	52	0.142
53	0	8.707	0	18.563	0	28.420	0	38.276	0	48.132	0	57.989	1	7.845	1	17.702	53	0.145
54	0	8.871	0	18.727	0	28.584	0	38.440	0	48.297	0	58.153	1	8.010	1	17.866	54	0.148
55	0	9.035	0	18.892	0	28.748	0	38.605	0	48.461	0	58.317	1	8.174	1	18.030	55	0.151
56	0	9.199	0	19.056	0	28.912	0	38.769	0	48.625	0	58.482	1	8.338	1	18.195	56	0.153
57	0	9.364	0	19.220	0	29.077	0	38.933	0	48.790	0	58.646	1	8.502	1	18.359	57	0.156
58	0	9.528	0	19.384	0	29.241	0	39.097	0	48.954	0	58.810	1	8.667	1	18.523	58	0.159
59	0	9.692	0	19.549	0	29.405	0	39.262	0	49.118	0	58.975	1	8.831	1	18.688	59	0.162
Mean Solar.	0^{h}.		1^{h}.		2^{h}.		3^{h}.		4^{h}.		5^{h}.		6^{h}.		7^{h}.		For Seconds.	